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Musical behaviours and development of children and young people with complex needs: three longitudinal case studies

By

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Abstract

This research provides the first longitudinal case studies (three cases altogether) through direct observations, to investigate and assess the musical behaviours and development of children and young people with complex needs, within the context of a special school.

The aims of this research are: (1) to create a new assessment procedure to systematically assess the musical behaviours and development of students with complex needs; and (2) to investigate the musical behaviours and development of three cases over eight to 13 months, using this new assessment procedure.

To carry out this research, the researcher uses the *Sounds of Intent* (*SoI*) framework as the theoretical foundation, the newly created assessment procedure as the operational tool and the case study approach as the overall methodological strategy. Several analytical perspectives are provided, including weekly data analyses, weekly profile analyses and termly analyses.

Research findings suggest that, firstly, it is possible to systematically assess and evaluate the musical behaviours and development of the students over a sustained

period of time, using the newly developed assessment procedure. Secondly, the data analyses of these students' concentric and stack profiles demonstrated a wide variation and range of musical behaviours over the observational period. Finally, across the three domains in the *SoI* framework, all the students showed different degrees of progress in their musical behaviours, and their musical development moved towards more complex musical behaviours in the latter observational period.

Following the data analyses, a list of preliminary factors which may explain the simpler and more complex musical behaviours of the students are offered. Relevant critiques and suggestions for further research are also provided to help the future development of the broad *SoI* research programme and to call for more research on music for children and young people with complex needs.

Declaration

I hereby declare that, except where explicit attribution is made, the work presented in this thesis is entirely my own.

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Glossary and list of abbreviations

AR	Annual Review
AT	Attainment Targets
Case study	Development of detailed, intensive knowledge about a single 'case', or of a small number of related 'cases' (Robson, 2002, p. 89)
CP	Cerebral Palsy
DCSF	Department for Children, Schools and Families
DfEE	Department for Education and Employment
DfES	Department for Education and Skills
Early years	Children under the age of five
Engagement	A state of absorbed intellectual or emotional arousal and connectedness with another person (or an activity)
ESL	English as a Second Language
Foundation stage	Children up to and including five years old
ICT	Information and Communication Technology, e.g. computer
IEP	An Individual Education Plan, jointly written by teachers, parents and pupil setting out progress strategies, regularly reviewed and updated
Informed consent	Agreement given by the pupil and their parent/guardian to participate in something outside the normal jurisdiction of the school, such as a research project
INSET	In-Service Training
Interactive domain	Musical behaviours occurs in the context of potential or actual communication that children and young people with complex needs are likely to follow
Key Stage 1 (KS1)	5-7 years old
Key Stage 2 (KS2)	7-11 years old
Key Stage 3 (KS3)	11-14 years old
Key Stage 4 (KS4)	14-16 years old
LAs	Local Authorities
Longitudinal studies	Quantitative and/or qualitative studies of one research entity at multiple time points (Berg, 2007, p. 293)
Musical behaviour	Children's perception and production of music and sounds
Motherese	A term used to describe the talk style parents use with babies involving shorter sentences, simple vocabulary, varied pitch and lots of questions

Ofsted	The Office for Standards in Education, the inspection board for school
PIVATS	Performance Indicators for Value Added Target Setting. PIVATS is an assessment programme used nationally to measure pupil progress through the P-levels and up to National Curriculum Level 4. It is an extended version of the P-levels
P-levels	A descriptive scale of attainments for children achieving below level 1 of the English National Curriculum attainment targets. Preparatory levels were introduced to aid bench-marking
PMLD	Profound and Multiple Learning Difficulties, that is, profound intellectual impairment combined with physical disability or sensory impairment
Primary	5-11 year olds
Proactive domain	Intentionality in sound production that children and young people with complex needs are likely to follow (e.g. creating, causing or controlling music and musical sounds)
PROMISE	The Provision of Music in Special Education (research initiative)
QCA	Qualifications and Curriculum Authority, a government body that oversees standards in training and education.
Reactive domain	The recognition and understanding of musical structure that children and young people with complex needs are likely to follow (i.e. responding to musical stimuli)
Secondary	11-16 year olds
SEN	Special Educational Needs
SLD	Severe Learning Difficulties
SoI	*Sounds of Intent* project

Chapter 1

Introduction

1.1 Research rationale - music for children and young people with complex needs

Many researchers believe that music has a special value for children with disabilities and learning difficulties (e.g. Nordoff and Robbins, 1965; Ockelford, 2000; Welch *et al.*, 2001; Jellison, 2006a; 2006b). Music is reported to help and develop these children's musical and non-musical skills (Wood, 1983; British Society for Music Therapy, 1998). In addition, music also promotes and maintains their well-being and quality of life (Sutton, 1993; Voigt, 1999; Wigram, 1999; Corke, 2002).

Education and statutory entitlement of this group of children developed only relatively recently, following the Education (Handicapped Children) Act 1970. Several authors (Dobbs, 1966; Bailey, 1973; Wood, 1983; Childs, 1996; Streeter, 1993; Jaquiss and Paterson, 2005) wrote about music education for children and young people with disabilities and learning difficulties, but paid little attention to the music education for children with the most profound levels of disability.

Schools, teachers and parents also report that music is a significant component in the lives of children and young people (ages 5 to 19) with complex needs (Welch et al., 2001; Ockelford *et al.*, 2006; Paterson and Zimmermann, 2006). It seems that music has a special value for human beings in different developmental phases and for their general well-being in the community. However, despite the recognition of the value of music for

this client-group, music education for children and young people with complex needs is still in its early stages (Ockelford, 2008).

In 2001, the then Qualifications and Curriculum Authority (QCA) published performance descriptions 'P–levels' for music of the music planning, curriculum and assessment for children and young people with complex needs to be used across the nation. However, due to a number of difficulties with them (see Chapter 4) and lack of empirically based research in the design of the P-levels (Ockelford, 2008), a research team in the Institute of Education, University of London, developed another route to understand these children's musical development, based on a study called the *Sounds of Intent* (*SoI*) project (see Chapter 4 for more details). In contrast to the P-levels for music, the *SoI* theoretical framework focused on the development of musical interests, abilities and preferences.

Currently there is a dearth of literature concerning (i) the musical behaviours and development that might be expected of children and young people with complex needs; (ii) the change and development of musical behaviours over a sustained period of time for such students; and (iii) assessment procedures based on the *SoI* theoretical framework, whereby empirical data can be gathered and analysed in relation to these students.

This situation motivated the researcher to focus on the investigation and evaluation of the musical behaviours and development of children and young people with complex needs. The researcher decides to carry out the first longitudinal case studies with this group of children and young people, which hitherto has not been undertaken.

1.2 Children and young people with 'complex needs'

The label 'complex needs' is commonly used in the UK with different interpretations, depending on different agencies' particular area of concern (Ockelford, 2008). In reality, many children and young people with complex needs do not fit neatly into one medical or psychological label due to the fuzzy concepts behind the labels and the lack of standardised criteria to support and define various disabilities. Moreover, multiple disabilities interact and influence each other and, as a result, can impact on the children's learning and development significantly (Hallahan *et al.*, 2005).

Since there is a lack of an unified definition for the term 'complex needs', this study will adopt the working definition of this term to refer to children and young people with aggregations of severe, or profound and multiple learning difficulties. (Ockelford, 2008, p. 2), which is in line with common practice in the UK, and will be denoted as SLD (Severe Learning Difficulties) and PMLD (Profound and Multiple Learning Difficulties).

The terms SLD and PMLD themselves, have no unified definitions either; and the researcher will use the following descriptions as the working definitions, which were suggested and accepted in the PROMISE research project concerning the provision of music education in special schools in England (Welch *et al.*, 2001). This project proposed that 'pupils with PMLD have profound global developmental delay, such that cognitive, sensory, physical, emotional and social development are in the very early stages (as in the first 12 months of usual development)', and that 'pupils with SLD have severe global developmental delay, such that cognitive, sensory, physical, emotional and social development are in the early stages (12 to 30 months of usual development)'

(Welch *et al.*, 2001, p. 9).

These working definitions imply that children and young people with complex needs function below their chronological age in all areas but 'some have markedly uneven profiles of development' (Ockelford, 2008, p. 3).

1.3 Research questions and contributions

The research questions frame the shape of the researcher's pursuit in this area of knowledge and understanding. Based on the situation stated in section 1.1, the research questions for this study are defined as:

- Is it possible to systematically assess and evaluate the musical behaviours and development for children and young people with complex needs over a sustained period of time, based on the theoretical framework (*SoI* framework) – and how could this be done?

- What is the nature of the observed musical behaviours and development for children and young people with complex needs over a given period of time?

To provide answers for these research questions, the *SoI* framework (as a theoretical framework), case study approach (as a methodological framework) and a newly developed assessment procedure (as an operational tool) are used as research strategies. Three longitudinal case studies are carried out. The intention is to focus on the profiles of observed musical behaviours and development of these students over a period of time (ranging from eight to 13 months), and to analyse these in the observational setting.

The researcher creates a new assessment procedure, partially based on the *SoI* theoretical framework, to assess, record and analyse the empirical data of the musical behaviours for the students. This new assessment procedure can be used flexibly for different research time frames, based on different research needs. The combination of the case study approach and the newly developed assessment procedure provides profiles of the students' musical behaviours and development over the observational period. These case studies also exemplify how to operate the new assessment procedure.

Within the case study approach, ethnographic fieldwork is also used to gather wider contextual background information for the case studies, including demographic information of the students in the special school and the nature of music provision at home and in the school.

The main original contributions of this research are as follows:

(1) The research provides the first detailed longitudinal gathering and analyses of musical behaviours data for multiple case studies (see Chapters 8 to 10). These contribute towards the under-researched areas concerning the musical behaviours and development for children and young people with complex needs, and help to map out empirically the individual musical development profiles over a sustained period of time.

(2) This research also provides a new assessment procedure (see Chapter 6), further developed from the *SoI* theoretical framework. This new assessment procedure not only provides a systematic way to record, transcribe and code the data, it also provides new analytical perspectives through the concept of frequency distribution tables and the colour coded profiles to enrich visual presentation.

1.4 Conceptual mapping

Fig. 1.1 provides a conceptual mapping which illustrates how this research is constructed and the relationships between different areas of knowledge and chapters.

The core circle represents the heart of this study. It contains the newly developed assessment procedure as the operational tool in this research (see Chapter 6) and the three longitudinal case studies (see Chapters 8 to 10). They are the main focus of this research.

Moving outwards to the middle circle – this includes the *SoI* framework as the theoretical framework (see Chapter 4), case study approach (with embedded ethnographic fieldwork) as the methodological framework (see Chapter 5) and the wider contextual background of the three case studies, including school music provisions and the students' musical experiences at home (see Chapter 7).

Finally, there are two items at the outer circle. One is the literature on early musical development (see Chapter 3). The other is a general review of the special educational system in England (see Chapter 2). These two items provide the overall contextual background for this research.

The relationships between different items in this research can also be seen from the linking arrows in Fig. 1.1. The knowledge of early musical development (Chapter 3) provides the foundation for the design of the *SoI* framework (Chapter 4). The *SoI* theoretical framework then becomes the base for the newly developed assessment procedure in this research (Chapter 6). The new assessment procedure is combined with

case study approach (Chapter 5) to carry out the longitudinal case studies (Chapters 8 to 10), so that the systematic analytical description of different students' musical behaviours is made possible. The contextual background of the case studies (see Chapter 7), which includes music provision in the special school, is generated from the ethnographic fieldwork approach (see Chapter 5). The special educational system in England and the special educational needs (SEN) (see Chapter 2) contributes to the wider contextual background of the special school. Thus, the music provision in the special school forms the contextual background of the three longitudinal case studies (see Chapters 8 to 10).

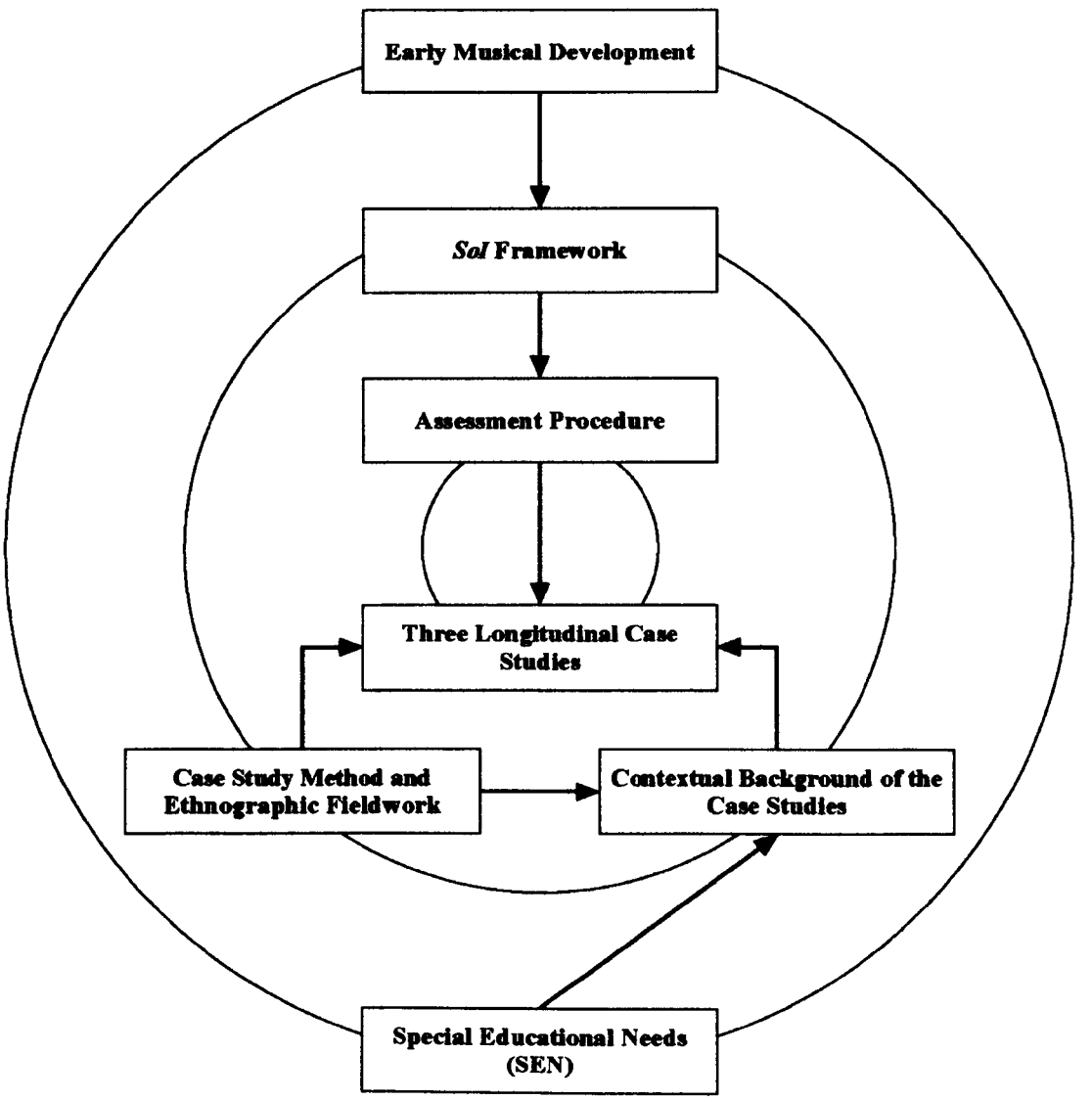


Fig. 1.1 The conceptual mapping in this research

1.5 Structure of the thesis

This thesis is organised into 12 chapters, grouped into four parts. Part I 'Literature and Theoretical Framework' comprises Chapters 2 to 4. Part II 'Research Strategies' comprises Chapters 5 and 6. Part III 'Main Research Findings' encloses Chapters 7 to 10. Part IV 'Discussion and Conclusion' comprises Chapters 11 and 12. The following paragraphs offer an overview for each chapter.

Part I Literature and Theoretical Framework

Chapter 2

Chapter 2 looks into the educational context of special education in England. It also informs the ethnographic fieldwork in this research when investigating the wider contextual background of the multiple case studies. It reviews a range of literature concerning special educational needs (SEN) and special school system. These cover the wider context where most students with complex needs are situated. They also provide different perspectives to enhance a more comprehensive background understanding.

Chapter 3

Chapter 3 looks into literature concerning the early musical development of 'typical' children. This provides a reference for studying children and young people with complex needs. The assumption adopted in this approach is that musical progress for these children is broadly in line with 'typical' early musical development. The chapter reviews the literature on prenatal and postnatal musical abilities, and draws on key concepts to enlighten the understanding of musical behaviours and development for children and young people with complex needs.

Moreover, since recent empirical findings concerning the musical development of the foetus and infants are one of the main sources for the design of the *SoI* framework (see Chapter 4), this chapter also looks into the categories relevant to the *SoI* framework. These categories include the physical responses, sensory and musical responses, cognitive issues of musical memory and vocalisation and social interaction of interactive vocal play. This chapter aims to provide a general picture of what can be expected in terms of musical development and experiences from prenatal and postnatal period. This can also help in mapping possible areas of the musical development that may be experienced by children and young people with complex needs.

Chapter 4

Chapter 4 rehearses key literatures concerning musical development in the context of special education. In 2001, the QCA published a guide pertaining to the current music planning, curriculum and assessment for children and young people with learning difficulties, with performance descriptions, 'P-levels', for music. However, Ockelford (2008) noted that 'although this framework [P-levels for music] has an English purview, there is no evidence elsewhere of a coherent, evidence-based music curriculum appropriate to the potential levels of attainment and progress of pupils with SLD or PMLD' (p. 4).

Because of the difficulties encountered with the P-levels, a research team at the Institute of Education suggested another route to understand these students' musical development based on a study called the *Sounds of Intent* (*SoI*) project. The *SoI* framework was then designed and revised into a second version. In this research, the researcher utilises the current second version of the *SoI* framework as the main theoretical framework for carrying out the longitudinal case studies.

Part II Research Strategies

Chapter 5

Chapter 5 presents an account of the research strategies that are adopted in the data collection and data analyses. Several issues in relation to the research methodology are also addressed such as the role and stance of the researcher, the selection of fieldwork site and cases, ethical issues and reliability and validity of this research.

This research mainly uses qualitative research methods in seeking to map and to understand the musical development of children and young people with complex needs over eight to 13 months. Amongst the available qualitative research approaches, case study approach is utilised as the main methodological framework. The ethnographic fieldwork, serving as part of the case study approach, helps to provide the wider contextual background information of the three case studies.

Overall, the data collection involves a variety of approaches in their naturalistic settings, including fieldwork observations, field notes, conversations and interviews with school staff and parents, school documentation, photographs, audio and video recordings.

Chapter 6

Chapter 6 proposes a newly developed assessment procedure as the operational tool to conduct the three longitudinal case studies systematically. There are a total of nine steps in the assessment procedure. The assessment procedure is partially based on the *SoI* theoretical framework, in steps 3, 4 and 8. The resulting raw data table in step 5, the frequency distribution table in step 6 and stack and concentric profiles in steps 7 and 8 with the graduated colouring system are the original contributions of the assessment procedure in this research (see Chapter 6 for more detail). The concentric and stack

profiles can be used to show the pattern of musical development over a period of time, with rich visual representation. They also serve as the foundation for the longitudinal case studies analyses.

Part III Main Research Findings

Chapter 7

Chapter 7 provides the wider contextual background information regarding the case studies. The main purpose of this chapter is to provide a detailed description of the musical and other-than-musical culture of the special school, which the students attended. It can be largely divided into two sections, concerning the background of a special school and its music provision.

The first section of the chapter gives the background of the research site, including the primary and secondary departments of the special school and the demographic background of the students in terms of their age and gender. The second section focuses on the special school's music provision, including general music provided in the school, music lessons and extra-curricular music projects.

Chapters 8-10

These three chapters present detailed analyses of the longitudinal case studies (cases J, K and H) to illustrate the musical behaviours and development of these children and young people with complex needs.

By using the newly developed assessment procedure in Chapter 6, detailed analyses are provided from several perspectives. These includes a background overview, weekly comments, weekly time series analyses and phase analyses, with relevant stack and

concentric profiles to facilitate and illustrate the students' musical development over eight to 13 months.

Part IV Discussion and Conclusion

Chapters 11 and 12

Chapter 11 summarises the three longitudinal case studies and offers overall cross-case comparison from both time series and cross-sectional perspectives. A list of preliminary factors that may offer explanations for these students' simpler and more complex musical behaviours are also proposed. Critiques concerning some theoretical and operational aspects of the *SoI* framework are provided, and further research areas are called for accordingly. Chapter 12 concludes and reviews the whole research study. Research implications for the music practitioners, school staff, management team and policy makers are suggested in order to maximise the students' potential and enhance the quality of their life.

Chapter 2

The context of special education in England

2.1 Introduction

The House of Commons Education and Skills Committee (2006) estimated that around 18% of all students in England were categorised as having Special Educational Needs (SEN), a broad category which includes children and young people with complex needs (defined as Severe Learning Difficulties or Profound and Multiple Learning Difficulties in this research). 'Around 3% of all children (250,000) had a statement of SEN and around 1% of all children were in special schools (90,000) which represent approximately one third of children with statements' (House of Commons, 2006, p. 5). In general SEN policy, it is believed that each child should be recognised as unique and each Local Authority (LA) should take into account the particular circumstances of that child.

From the overview of the literature, the researcher draws several key concepts and relevant issues concerning children and young people with complex needs to form the educational background of this research. They are to provide different perspectives to gain a comprehensive contextual understanding of this study. These issues include special educational needs (SEN) (see section 2.2) and the special school system and services (see section 2.3) where the three cases are situated.

2.2 Special Educational Needs (SEN)

Children are broadly defined as having SEN when they find it much harder to learn than others of the same age and may need extra help due to their difficulties (DfES, 2001a, p. 4). The 1981 Education Act stated that, 'a child has special educational needs if he or she has a learning difficulty which may be a result of a physical or sensory disability, an emotional or behavioural problem or developmental delay' (1981 Education Act, Section 1; Fox, 1998, p. 1).

In some children with SEN, several overlapping disabilities may be apparent. People with profound learning disabilities always need help and support in every aspect of their lives in what is a lifelong condition (Hallahan *et al.*, 2005; www.towerhamlets.gov.uk, 2007). Hallahan *et al.* (2005) explained that 'there are no simple remedies or easy cures for learning disabilities' (p. 41), but teachers and other professionals can help individuals with learning disabilities 'achieve at levels that allow them to live satisfying and fulfilling lives' (p. 40).

The SEN Revised Code of Practice (DfES, 2001b) stated that there are four areas of SEN. The proportion of each category in special schools is as follows (Jaquiss and Paterson, 2005, p.16; Every Child Matters, 2005):

1. Cognition and Learning Needs: Specific Learning Difficulties (SpLD); Dyslexia; Moderate Learning Difficulties (MLD) (31.5%); Severe Learning Difficulties (SLD) (24%); Profound and Multiple Learning Difficulties (PMLD) (7%).
2. Behaviour, Emotional and Social Development needs: Behaviour, Emotional and Social Difficulties (BESD) (13.7%); Attention Deficit Disorder (ADD); Attention Deficit Hyperactivity Disorder (ADHD).

3. Communication and Interaction Needs: Speech, language and communication needs (3.4%); Autistic Spectrum Disorder (ASD) (10%); Asperger's Syndrome.
4. Sensory and/or Physical needs: Hearing impairment (HI) (2%); Visual impairment (VI) (1%); Multi-sensory impairment (MSI); Physical difficulties (PD) (6%)

As Hallahan *et al.* (2005) noted, 'learning disabilities sometimes co-occur with other problems and disabilities' (p. 41), and the children and young people in the three case studies all have cognition and learning needs with SLD and PMLD, communication and interaction needs and sensory and/or physical needs. These students all have a Statement of SEN and are educated in a special school.

2.2.1 Brief history of SEN

It is important to understand some of the background which underpins the way children are identified as having SEN in mainstream settings and in special schools. Under the 1944 Education Act, children were categorised by their disabilities such as 'educationally sub-normal' or 'maladjusted' and people referred to the children by their labels such as, 'physically handicapped' or 'mentally handicapped'. Many children were considered to be 'uneducable' (House of Commons, 2006) and before 1971, as a result, Marvin (1998) notified that these children were 'excluded from the education system in Great Britain (p. 117).

However, since the *Education (Handicapped Children) Act* (1970) and the Warnock Report in 1978, which aimed to include all children in a common educational framework and which transferred the responsibility for children with complex needs from Health Authorities to LAs, attitudes towards this issue started to change. This can be demonstrated in the rafts of legislation that followed. The House of Commons Education and Skills Committee (2006) stated that the

> 'Warnock Report in 1978...introduced the idea of special educational needs (SEN), "statements" of SEN, and an "integrative"—which later became known as "inclusive"—approach, based on common educational goals for all children regardless of their abilities or disabilities: namely independence, enjoyment, and understanding' (http://www.publications.parliament.uk/pa/cm200506/cmselect/cmeduski/478/478005.htm#a1).

The Warnock Report (1978) influenced the philosophy underpinning the 1981 Education Act, which estimated that about 20% (every 1 in 5) children might have SEN during their school life and the provision for SEN could take up to a short time or many years. It also estimated that only 2% (1 in 50) children would have such severe and complex difficulties that additional resources or provision were required to meet their needs (Fox, 1998). The 1981 Education Act placed the focus on children's SEN rather than their disabilities and the special educational provision required to help them learn. In addition, it stressed that SEN is a relative term which related to the environment and schools' ability to meet the child's needs.

Recent legislation, particularly the SEN and Disability Act (SENDA) 2001 and the 2004 SEN Strategy *Removing Barriers to Achievement*, has sought to develop the Warnock SEN framework and set out a new educational vision for children with SEN and disability. These new perspectives help educators to see difficulties in learning as arising from the interaction between a child and their environment and not solely within the child. Schools have increasingly taken responsibility for providing levels of support that are necessary for these children to learn effectively (Fox, 1998). Because of this inclusive approach, today the majority of children have their SEN met in mainstream settings. However, the majority of those with complex needs (PMLD/SLD) are still educated in special schools (Ockelford, 2000, p. 198).

2.2.2 SEN assessment

Parents, class teachers or the special educational needs coordinators (SENCO) can initiate a child's SEN assessment if they find that the child is having significant difficulties in learning. At first, the three parties will get together and plan how the child can be helped in class and at home. This process is called 'School Action', and they will decide what kinds of extra help the child might have. A teaching and learning plan called an 'Individual Education Plan' (IEP) for the child is then drawn up by the SENCO working with the child's teacher, teaching assistant and, possibly, with ideas from parents, advisory teachers or educational psychologists. The formalised IEP and accompanying Annual Reviews for all children identified as having special educational needs have been used for some time in special schools (Marvin, 1998). Fox (1998) noted that it is very important to involve the child if at all possible in making the IEP, and that the IEP should contain:

- description of the nature of the child's learning difficulties;
- action – the special educational provision; staff involved, including frequency of support; specific programmes/activities/materials/equipment/measurement;
- parents' contribution at home;
- targets to be achieved within a given time;
- any pastoral care or medical requirements;
- monitoring and assessment arrangements;
- review arrangements and date

(Fox, 1998, p. 3).

The IEP should be dated for reviewing of a student's progress and show the steps that are taken to support the child's learning. The document will also consider the child's strengths and areas that need development. The set targets will be reviewed regularly or

at least twice a year, involving parents and specialists' consultation (http://www.learningtrust.co.uk/special_needs/schools/iep.aspx, 2007).

After some time, if the parents or the school feel that the child requires additional help, then SENCO will seek specialists' advice and support from external professionals or agencies such as educational psychologists or specialist teachers. The school may also provide additional support on its own for a small group of children. The provision is called 'School Action Plus'. If the student's progress still can not yet meet the expectation set in the IEP after 'School Action Plus' or is not making adequate progress, then the parents or the school may apply to the SEN Service for a Statutory Assessment of the child's needs.

Each LA has a duty to provide SEN assessment and identify the arrangements necessary for the student's special educational provision. The LA will decide either to proceed with the Assessment or issue a 'Note in Lieu of a Statement' explaining how the school can use its current resources to meet the child's needs. The LA will make a decision as to whether or not to assess, within 6 weeks of receipt of the request.

Under the Education Act 1996, the Statutory Assessment will gather information, process reports and seek advice from the parents, the school and a range of agencies that have worked with the child. The SEN Code of Practice (2001) also stresses the need for schools, LAs, health services, social services, specialist teachers, education welfare services, voluntary organisations, speech and language therapists, physiotherapists, occupational therapists and child psychiatrists and any other agencies to work closely with each other and with parents during the assessment process. It will take a maximum of 18 weeks from the date of the request to issue a Statement and inform the parents of the outcome (http://www.learningtrust.co.uk/special_needs, 2007).

Parents and carers also play an important role in their child's SEN assessment process. They are invited to visit the school that is identified in the Statement, to talk to the headteacher, to see the class into which their child may be admitted and to talk to the appropriate staff. Parents can also offer their views for the children's placement at any maintained school or outside the maintained sector. If parents are not satisfied with particular details of the Statement or the LA's decision, they have the right to appeal to the Special Educational Needs and Disability Tribunal.

2.2.3 SEN Statement

The SEN Statement is a document which describes a child's special needs and what special help the child should receive. It also specifies what type of school the child needs. The revised Code of Practice for SEN (implemented in 2002) describes a cyclical process of planning, target setting and review for children with SEN. The fundamental principles of the Code are as follows:

- a student with SEN should have their needs met;
- the special educational needs of students will normally be met in mainstream schools or settings;
- the views of the student should be sought and taken into account;
- parents have a vital role to play in supporting their children's education;
- students with SEN should be offered full access to a broad, balanced and relevant education, including an appropriate curriculum for the foundation stage and the National Curriculum

(Jaquiss and Paterson, 2005, p. 8).

SENDA (2001) amended the Disability Discrimination Act 1995 and created new duties for schools in three areas to promote inclusion. In line with the revised National

Curriculum (2001) which emphasised the provision of effective learning opportunities for all learners, schools need to:

- anticipate where barriers to learning lie and take action to remove them and overcome potential barriers to learning and assessment;
- plan strategically to increase the extent to which disabled students can participate in the curriculum and the set up of suitable learning challenges;
- make the physical environment and materials accessible and respond to the students' diverse learning needs.

However, there will be exceptional cases in which it is felt that the child should attend one of the LA's special schools, a school with resourced provision, or a specialist school in a different borough so that their needs are best met. When the decision is made on proposed resources and placement, it will be written on the Statement. The principles for inclusion explained by Marvin (1998) are as follows:

> 'it is important to confirm that, unlike some definitions of inclusive education, the one put forward here does not imply that every child, no matter what their disability, should be educated in a mainstream setting in the same room as their mainstream peers all of the time. But each member of the staff team can play a role in promoting inclusion through the deployment of teaching approaches which strive to foster the entitlement of all children to a broad, balanced and relevant curriculum which is offered alongside their peers where appropriate. Furthermore, inclusion demands that pupils are encouraged to play a greater part in every stage of their learning (however small this may be) which, in turn, places great emphasis on the fostering of the skills which lead to choice making' (p. 127).

2.2.4 SEN and other sociological factors

SEN and Gender

Lindsay *et al.* (2006) stated that the number of children with a statement of SEN is much higher for boys than for girls: around 2.63:1. Around 1 in every 37 boys had

statements of SEN (100,600 boys in total), compared with around 1 in every 100 girls (38,200 girls in total) in primary and secondary schools. This was confirmed in the House of Commons Education and Skills Committee's third report on Special Educational Needs in 2005-2006: 'at all ages, a significantly higher proportion of boys than girls in the school population have SEN statements' (p. 33). In the UK and the USA government research, such as House of Commons (2006) and Hallahan *et al.* (2005), both were in agreement that there is a strong association between gender and special education in that 'boys outnumber girls about 2 to 1 in learning disabilities' (Hallahan *et al.*, 2005, p. 34).

More research is needed to find out the explanation for greater number of males identified for learning disabilities. Hallahan *et al.* (2005) noted that 'some authorities have pointed to the possibility of greater biological vulnerability for boys as an explanation for this gender difference' (p. 35) but other authorities also suggested another point of view on the possibility of 'bias in referral and assessment procedures' explaining that 'boys might be more likely to be referred because they are more likely to exhibit behaviors that are bothersome to teachers, such as hyperactivity' (Hallahan *et al.*, 2005, p. 35).

SEN and socio-economic background

In the literature, there were two different views for the relationship of SEN and socio-economic background. Hallahan *et al.* (2005) noted that 'students with learning disabilities come from all ethnic backgrounds, ages, and social groups' (p. 41). However, the Development for Education and Skills research report by Lindsay *et al.* (2006) acknowledged that social-economic disadvantage and gender have a stronger association than ethnicity with the overall prevalence of SEN.

The Department of Education and Skills (2006) reported that 'pupils from economically disadvantaged circumstances tend to have higher rates of SEN identification than those from less economically disadvantaged circumstances' (p. 28). The National Statistics (2006) data also showed that the proportion of children known to be eligible for free school meals was much greater for children with SEN than for those who do not have SEN, a proxy indicator of socio-economic deprivation. In primary schools, 28% of children with SEN were known to receive free school meals whereas 13% children without SEN received free school meals. In secondary schools, 26% of children with SEN against 11% of children without SEN were eligible for free school meals. Similarly, the House of Commons Special Educational Needs Report (2006) stated that 26.5% of secondary and 26% of primary children with SEN statements received free school meals compared with 13.6% in mainstream secondary and 16% in primary schools who were eligible for free school meals.

Moreover, the 'figure rose a great deal higher in some areas with nearly 50% of all children with statements being eligible for free school meals in Inner London' (The House of Commons, 2006, p. 33). Families that were in receipt of certain means-tested social security benefits, such as income support, income based job seekers allowance, or support under Part VI of the Immigration and Asylum Act 1999 were eligible for free school meals. If a family was in receipt of Child Tax Credits with a total yearly income of less than £14,155, they also received free school meals. For families who received free school meals, the above qualified circumstances might have possible impact on the parental abilities and knowledge to access good services and continue their children's learning at home.

2.3 Special schools system in England

For many children with SEN, special schools currently appear to offer the appropriate educational opportunities. Special schools aim to have a broad range of high quality resources and provision to meet the needs of their students and put the needs of the children at the centre of provision. The white paper *Removing Barriers to Achievement* (2004) set out the Government's vision for giving children with SEN the opportunity to succeed. Special schools are regarded as having an important role to play in educating all children with SEN by sharing their expertise with mainstream schools to support greater inclusion. This may be done through promoting greater staff movement across sectors and more children moving between the sectors to be considered in their statement annual reviews.

Every Child Matters (2005) estimated that more than 93,000 children attended special schools, just under 2,000 of whom spent some of their time also in a mainstream school. The student-teacher ratio in special schools was 6.3:1 whereas the ratio in maintained primary schools was 22.7:1 and in secondary schools was 17:1. Boys made up just over two thirds of children attending special schools. Secondary school age children made up nearly two-thirds of the population in special schools. In addition, more than a third of children in special schools were eligible for free school meals which was roughly twice as many as in mainstream schools (http://www.everychildmatters.gov.uk/ete/agencies/specialschool, 2008).

2.3.1 Types of special schools

Special schools make special educational provision for children and young people with statements of SEN, whose needs cannot be fully met within mainstream settings. The House of Commons Education and Skills Committee (2006) reported that in 2004 there

were 1,148 maintained and non-maintained special schools in England. Being part of a spectrum of educational provision for children with SEN, there are three types of special school in the UK. They are the maintained special school, non-maintained special school and independent special school. Maintained schools are funded by the LAs and are subject to the same legislative provisions as other mainstream schools. Most special schools are maintained schools which can be either 'community' or 'foundation' schools (Education Act 1998). The three case studies in this research were carried out in a maintained special school.

Non-maintained special schools are run by charitable trusts as non-profit making enterprises. The LAs and sometimes parents or third parties fund the children's fees to the schools. Independent special schools are funded by children's fees and can be run on a profit making basis. Parents can pay for their child's placement privately but most students are placed by LAs. In order to become an independent special school, the school will need to have at least 50% of children who have SEN and 25% of children who have SEN statements (http://www.everychildmatters.gov.uk/ete/agencies/specialschool, 2008).

2.3.2 Duties of special schools

Special schools have the same responsibilities as mainstream schools in that they must have regard to the National Curriculum and carry out statutory assessment procedures. They need to produce the same range of school policies in areas of discipline, child protection, non-discrimination and equality. The main difference between special schools and mainstream schools is that almost all the children and young people who attend the special schools have a statement of SEN. As a result, special schools have a higher ratio of teaching staff to students and a broader range of other practitioners and support staff to work with these children in meeting their individual needs.

Admissions to special schools are determined by children's statements of SEN. As long as a special school is named in a child's statement, and there is a place available, the school will need to admit the child. Before putting down a school's name in a child's statement, the LA must consult the school and the home LA if the special school is maintained by another LA.

2.4 Summary

This chapter looked at a range of literature concerning the wider special educational context for children with complex needs, including SEN and the special school system in England. The definition of SEN and its brief history were provided to assist understanding of the change in people's perception for children with complex needs. The SEN assessment and SEN statement helped the special educational system to enable students with SEN to reach their full potential, to be included fully into their school communities, and to make a successful transition to adulthood (Fox, 1998). Children with SEN needed to go through a multidisciplinary assessment procedure before the LAs could determine whether they will issue the SEN statement or not. It also demonstrated how it worked to place a child with complex needs into a mainstream or special school. The majority of the children with SEN attended the mainstream schools but the minority were placed in special schools so that, as demonstrated, their educational needs could be better met.

Literature suggested that SEN had a strong association with gender but had diversified opinions on the socio-economic disadvantage matter. An overview of the special school system in England showed that there was a higher ratio of teaching staff to students and a broader range of other professional practitioners and support staff to work with children and young people with complex needs.

Apart from the wider special educational context in England, the next chapter will review the literature concerning 'normal' early musical development and will illustrate a possible musical development path for children with complex needs (in Chapter 3). The review of the literature pertaining to the conceptual overlapping areas of Chapter 2 and Chapter 3, concerning musical development in the context of special education, will be provided in Chapter 4.

Chapter 3

Early musical development in the 'non-special' education population

3.1 Introduction

The literature of early 'typical' musical development informs and sheds light on the musical development for children and young people with complex needs. Music has a special value for human beings in different developmental phases and for their general well-being in the community. Hallam (2006) acknowledged that 'there is abundant evidence that humans as a species are 'musical', that we share similar brain structures that respond to music, and that exposure to music and engagement with it improve measured musicality' (p. 106). Children's musical abilities appeared to be influenced by both genetic instructions and learning experiences according to the general and musical brain development. Engagement in musical experiences at an early age shaped children's neural systems and forms their musical brain, as Hodges (2006) reported that they will have

> 'An enlarged corpus callosum, reflecting the need for hand co-ordination and for information sharing between the two hemispheres. They will also have a larger cerebellum, reflecting the need to synthesize motor, sensory, and cognitive information and to co-ordinate responses...Studying music at an early age also causes increases in the left auditory association cortex, reflecting increased auditory processing demands' (p. 62).

The literature on prenatal and postnatal musical development can assist in mapping possible areas of the musical development of children and young people with complex needs, including awareness of sound, detection of changes in sound and recognition of

patterns in sound. In this research, the researcher uses 'typical' child development as the reference for studying children and young people with complex needs. The assumption adopted in this approach is that musical progress for these children is broadly in line with early musical development of typical children, and the knowledge of typical musical development might help us to understand the musical behaviours and development of children and young people with complex needs.

Moreover, musical development and recent empirical findings concerning fetuses and infants were one of the main sources for the design of the *Sounds of Intent* (*SoI*) framework (see next chapter, Fig. 3.3), especially in its various domains and levels. The 'Reactive' domain has links in 'typically developing' children to the perception of motherese, the auditory system, cognition and memory and the musical environment. The 'Proactive' domain relates to infants' vocal development and their capacity to produce sounds. The 'Interactive' domain relates to how infants' responds to motherese, communication, auditory learning and interactive vocal play.

The following sections review the literature on prenatal and postnatal early musical development, and draw on key concepts to enlighten the understanding of musical behaviours and development for children and young people with complex needs. The review will be presented in two main sections relating to prenatal and postnatal musical development, with several sub-sections, including (1) musical/sound environment, (2) physical responses, (3) sensory and musical responses, (4) cognitive issues and (5) communication and social interactions.

3.2 Prenatal musical development

Early musical development begins from prenatal, as soon as the auditory system starts to function (Welch, 2005). Moreover, Welch & Adams (2003) believed that innate musicality is nurtured prenatally 'by the sounds made by caregivers and subsequently shaped by the sound world and local culture into which we are born and raised' (p. 6). The prenatal development of foetal behaviours indicate that the foetus is sensitive to sound and musical elements (Parncutt, 2006) under certain sound environments. For example, prenatal familiarisation to certain sound stimuli may contribute to a neonate's particular musical sensitivity who then forms a preference for the maternal voice (Lecanuet, 1996).

3.2.1 Physical responses

Through ultrasonography, foetal perception of sounds is evidenced in their body and breathing movements throughout the third trimester (Abrams and Gerhardt, 1997). During the third trimester, the foetus shows a whole range of motor behaviour and physical activities with stable movement patterns. A significant proportion of its movements relate to specific responses to sound, touch, changes in light and other sensations that are present at this stage (Karmiloff & Karmiloff-Smith, 2003).

Around 25 weeks of pregnancy, a sound emitted from a loudspeaker placed on the stomach of a pregnant woman produces a jerky and startle-type movement from her foetus and this may cause the foetus' heart to beat faster and increase the baby's motor movements (Lecanuet, 1996). Karmiloff & Karmiloff-Smith (2003) stated that 'it is only at 25 weeks that ultrasound images can show that they are actually reacting to what they hear with immediate startle responses, and not just moving arbitrarily' (p. 15). By about 26 weeks, the foetus begins to respond to sound through accelerations or

decelerations of their heart rate (Lecanuet, 1996; Parncutt, 2006). At 28 to 32 weeks, foetal motor and behaviour change, startled responses and increased heart rate responses to external sounds become more consistent and reliable (Lecanuet, 1996; Parncutt, 2006).

Lecanuet (1996) reported that 'by 8 months, motor response and accelerative change rates found in most studies are between 70 and 90 per cent' (p. 13). At 38 weeks, foetal motor and heart rate responses are more frequent. At 35 to 41 weeks and in newborns, the responses are modulated by the characteristics of the stimulus (loud vibroacoustic or airborne stimuli) and the foetal state (active sleep, quiet sleep, active wakefulness and quiet wakefulness). A drawback of these behavioural measurements is that the foetus may not react to stimuli every time it perceives them (Parncutt, 2006).

Reports from pregnant women (Karmiloff & Karmiloff-Smith, 2003) showed that the foetus reacts differently according to the type of music emitted in the environment. Karmiloff & Karmiloff-Smith (2003) noted that 'although at 32 weeks' gestation the unborn baby may generally react to musical sounds, it isn't until 38 weeks that they begin to distinguish between different styles of music' (p. 20). In other words, the foetus reacts to different styles of music after the 38th gestational week. However, Lecanuet (1996) held a different position on this issue and suggested that other factors i.e. loudness, pitch and the behavioural state of the baby, rather than the type of music might control the reaction of the foetus.

3.2.2 Sensory maturation

Hearing is one of the earliest senses to present itself and the auditory system is well developed in the final trimester of intrauterine life. In the last three months of pregnancy, the neurons of the foetal auditory cortex system are functioning and the foetus can

respond to sounds (Hodges, 2006). Hodges (2006) noted that 'musical sounds presented during the last 3 months before birth can have an effect on subsequent infant behaviour, an indication that the foetal brain is at least able to register and remember musical sounds' (p. 56). The foetal auditory system or sense of hearing begins to process sounds between about 15 and 20 weeks (Mosby, 2002; Parncutt, 2006). The middle and inner ear development continue until the eighth month with synaptic connections with the central nervous system (Lecanuet, 1996).

Within the sound world in the uterus, the foetus learns to recognise and differentiate their mother's voice from other sounds outside and inside the mother's body (Lecanuet, 1996; Abrams and Gerhardt, 1997; Parncutt, 2006). Karmiloff & Karmiloff-Smith (2003) declared that 'researchers have now pinpointed the extraordinary sensitivities the foetus has to her mother's heartbeat, to music and particularly to her mother's voice' (p. 10). In addition, the foetus is able to differentiate maternal speech from the background noise (Lecanuet, 1996) and associates changes in the tone of the mother's voice with other physiological clues about what the mother is experiencing (Karmiloff & Karmiloff-Smith, 2003). Parncutt (2006) noted that the uterine muffling strongly affects the mother's speech because the lower sounds are inaudible when identifying vowels and consonants. This may partly explain why infants are more interested in maternal singing than maternal speech. Another reason for this may be that maternal expression is exaggerated more in singing and more learning is facilitated by maternal singing compared to speech (Parncutt, 2006).

Prolonged exposure to selectively enriched sound environments 'stimulates local dendritic growth, modifies the reactivity of central acoustic units, and seems to facilitate some discriminative auditory tasks' (Lecanuet 1996, p. 18). The behavioural effects of auditory prenatal experience are habituation (getting used to and stopping responding to

a repeated stimulus) and conditioning which both occur for the foetus. At 37 gestational weeks, conditioned and trained foetuses responded immediately with movements to a particular musical theme but the control group moved only 6-10 minutes later (Lecanuet, 1996).

The senses and cognition develop side by side during the prenatal period. Prenatal familiarity to specific sounds may contribute to the development of particular sensitivity to the mother's voice, particular musical sequences when read or sung by the mother during the last weeks of her pregnancy, some particular musical sequences and a given maternal language. This 'structurally organized acoustic stimulation may contribute to shaping auditory abilities and to developing long-term preferences or general sensitivity to the type of sounds experienced' by the foetus (Lecanuet, 1996, p. 25).

3.2.3 Cognitive issues

Parncutt (2006) stated that 'without auditory learning and memory, there could be no prenatal psychological or musical development' (p. 8). From the sixth month of gestation, the foetus uses its ears to listen and its brain to memorise the sounds that it hears in the uterus. From this stage, the pathways in the auditory cortex in the brain are already formed (Karmiloff & Karmiloff-Smith, 2003). Parncutt (2006) suggested that prenatal ability to memorise complex sound patterns and the ability to process various aspects of language in association with emotion begin before birth. From as early as 32 weeks' gestation, a foetus can form a memory of an item of music heard every day, and will recognise it even after birth. If certain pieces of music have been played to the foetus frequently before birth, the infant's behaviour after birth shows that they respond to the music with heightened alertness, lower heart rate and fewer movements. Researchers (Lecanuet, 1996; Karmiloff & Karmiloff-Smith, 2003; Parncutt, 2006) mostly agreed that the most audible and frequent prenatal sound sources last longer in

the postnatal memory.

3.3 Musical development in the first years of childhood

Evidence from listening, interactive communication and vocal production (Papoušek H, 1996; Malloch, 1999) showed that humans' musicality is usually in place shortly after their birth. As children develop, their engagement with music develops in complexity (Trevarthen, 2002; Hodges, 2006; Trehub, 2006; Hallam, 2006). Musicality involves biological maturation and requires a rich musical environment and enculturation. Infants demonstrate their musicality in 'their precocious music listening skills, excellent memory for music, highly musical environment, and intense interest in expressive musical performances' (Trehub, 2006, p. 33). In addition, Papoušek (1996) acknowledged that musicality has been found to play an important role in the infants' communicative development which is part of their speech development.

The following sections look at infants' and young children's musical development in relation to their supportive musical environments, physical, sensory, cognitive and social aspects in the first years of life. This part of the literature aims to provide a general picture of 'typical' children's musical development in order to inform concepts of the various developmental stages and to provide a reference for children and young people with complex needs.

3.3.1 A rich musical environment

Musical enculturation in early childhood involves spontaneous song-making, singing, dancing, playing together and improvising with instruments. Infants' cognition, learning abilities and verbal symbolisation have an intimate connection with sociocultural integration (Papoušek, 1996). Burnard (2006) noted that the musical enculturation is

rather sophisticated and constantly evolving. The early vocal and gestural musical responses are innate, and culturally significant musical behaviours happen in the production of song and action games as an 'infant-parents' playful sharing' (Burnard, 2006, p. 362). Trevarthen (2002) wrote that 'when a 6-month-old smiles with recognition of a favourite song, and bounces with the beat, it is like knowing his or her name, displaying a social 'me' within the family's affectionate pleasure of sharing' (p. 22).

The acoustic characteristics of the maternal culture significantly shape the infant's vocal production (Welch, 2005; 2006). From two to five years old, Pouthas (1996) noted that children begin to incorporate aspects from the maternal community and culture in their spontaneous vocalisations of nursery songs. Similarly, Burnard (2006) explained that infants develop their musical behaviours 'through experience of making music, exploring sounds, acquiring expressive vocabulary, and developing manipulative skills in response to specific cultural environments' (p. 363).

3.3.2 Physical responses

Infants' responses to music are predominantly through physical action and singing. Fassbender (1996) reported that infants respond to certain sounds and music with head turns and with different sucking rate and strength. From 2 to 5 months old, an infant is able to control and vary their sucking response. After six months, when the neck muscles are strong enough to support the head to allow for head turns, infants can locate sound sources with accuracy. As Fassbender (1996) noted, 'newborns turn their head in response to sound sources, but before they are 6 months old this behaviour does not occur with precision and reliability' (p. 57).

Carers or parents often intuitively rock or bounce young infants while singing to them, and the matching of rhythm across sound and movement patterns influences how infants perceive music (Pouthas, 1996; Trehub, 2006). Pouthas (1996) acknowledged that 'babies were found to sway and bounce rhythmically in response to music up to the age of 6 months or so, and the co-ordination between these movements and the timing of the music was found to gradually increase with age' (p. 158). Around eight months old, infants are capable of detecting changes in tempo and rhythm which 'enable adults and children to synchronise their behaviour when singing, dancing or clapping with others' (Trehub, 2006, p. 36). As Erdonmez (1993) noted, 'rhythm provides a structure and order, both are essential elements to motivate movement' (p. 114).

Between the ages of 18 and 24 months, 'a regulation of the rate of the operant response first appears' (Pouthas, 1996, p. 132). The major developments during this time require practice of physical skills and co-ordination. It is not until two years of age that children can synchronise their movements to a beat in a short period of time (Moog, 1976; Parncutt, 2006). Pouthas (1996) noted that sensorimotor activity characterises infants' musical 'composition'. With intrinsic pleasure and enjoyment, these activities focus on mastering the means of producing sounds and gaining physical control.

3.3.3 Sensory and musical responses

Newborns are capable of segregating the sound streams. After birth, neonates are able to focus attention selectively and separate the sound of their mothers' voices from background noise and other voices (Lecanuet, 1996; Bee, 1997; Hodges, 2006). The neonates can hear with acuity sounds within the pitch and loudness ranges of the human voice (Bee, 1997).

Papoušek (1996) claimed that prenatal exposure to, and familiarisation with, certain auditory stimuli contribute to newborns' auditory preference. Newborns are attracted to their mother's voice, a musical melody, a spoken text (with certain prosody which included melody, rhythm and dynamics) and the mother's language which are played daily during the last three months of pregnancy. Moreover, infants' learning capacities develop enormously during the first months of life due to maturation and practice (Papoušek, 1996). During the first month of life, young infants are very sensitive to frequency spectrum, amplitude and harmonicity of temporal changes in sound attributes. Infants' ears are fine-tuned to detect musical change and listening preferences. Trehub (2006) reported that 6 to 10 months old infants would detect and turn towards the loudspeaker on the occurrence of melodic or rhythmic changes. Moreover, newborn babies can distinguish normal speech from motherese intoned speech which has exaggerated contours in their mother's voice (Lecanuet, 1996).

The sensory modalities are coordinated and reliable around four months old (Pouthas, 1996; Bee, 1997). Pouthas (1996) noted that 'infants can associate what they see with what they hear when the auditory and visual stimuli are linked' (p. 127). The multimodal sensory information provides synchronisation of vocal and kinetic patterns through tactile, kinaesthetic and visual information.

Pitch and melodic contour

Pitch and melodic contour are central features of early musical perception (Pouthas, 1996). The pitch contour of a melody can gain the infants' attention and they can notice overall contour differences (Trehub, 2006). Melodic contour has a critical role in the infants' reproduction of the imitated melodies (Fassbender, 1996). During the first three to four months, infants can imitate their mother's exaggerated prosodic pitch contour and 'vowel-like harmonic resonance' (Papoušek, 1996, p. 98). By four months of life,

babies attend to and discriminate between melodies in different patterns of sounds. At the age of five or six months, infants are able to discriminate different melodic patterns on the basis of relational information. They are sensitive to violations of contours and the sequential structure of melodies (Papoušek, 1996; Welch, 2005).

From seven to 10 months old, infants have the ability to identify absolute pitch and relative pitch. Infants can focus on either absolute or relative pitch cues depending on the nature of the musical task and their previous listening experience (Welch, 2005; Trehub, 2006). Infants' ability to detect the underlying structure of simple melodies can be significantly improved by training. Research of infants' musical preferences showed that they can differentiate between different tempo, pitch level, voice quality, and show preference in certain musical patterns (Trehub, 2006).

Temporal auditory patterns and timbre

Most musical memory appears in melodic and rhythmic factors. Infants seem to be able to recognise basic similarities in rhythmic sequences, regardless of tempo change (Pouthas, 1996). Infants can also discriminate between contrasting temporal and rhythmic sequences in terms of duration, pause length and tempo. As early as two to two and a half months of age, infants tend to impose rhythmic patterning on melodic sequences and are capable of detecting a change and can discriminate one rhythmic sequence from another. From early on, infants are sensitive to and able to detect changes in speech and music on their melodic contours, temporal patterning and variations, pitch and timbre. They can discriminate between contrasting temporal and rhythmic sequences (Trehub, 2006).

Moreover, Trehub (2006) noted that around six and eight months, infants group the perceived tones on the basis of similarities in their pitch, loudness and timbre. They

group the auditory sounds into meaningful chunks and notice relationships between these chunks. They group auditory sounds on the basis of Gestalt Laws of frequency proximity and similarity in amplitude and spectral of sounds (Fassbender, 1996; Papoušek, 1996). Their auditory grouping also enables them to make sense of sound stimuli (Fassbender, 1996; Papoušek, 1996) and they do not perceive sounds as a series of isolated events. Like adults, infants have the same capacity to restore the sounds that they hear in order to understand and to anticipate what is going to happen next.

Around six to 11 months, infants show their sensitivity to musical phrasing and can distinguish the musical phrases by perceiving a long-duration note or pauses as a boundary between the phrases. After six months old, infants show their preference for well-phrased music (Bee, 1997). Infants also respond to relative duration cues and detect changes in tempo and are sensitive to metrical cues (Fassbender, 1996; Trehub, 2006). For example, infants are capable of detecting increases in silent intervals within a group of similar tones. Trehub (2006) wrote that, 'the universality of synchronized rhythmic behaviour implies that listeners readily discern the metrical structure of music' (p. 36).

At the age of seven months, infants are sensitive to timbre differences among tones (Fassbender, 1996). Through the global and relational principles of perceptual organisation, infants are able to discriminate between contrasting timbres and they can detect subtle changes in musical patterns. Papoušek (1996) proposed that these developments seemed to be based upon biological predispositions.

3.3.4 Cognitive issues - musical memory and vocalisation

Infants seem to remember complex musical passages after two weeks of daily exposure. Trehub (2006) reported that 'infants may be able to remember more musical features

from music that is relevant to their experience or interests' (p. 38). The aspects of an expressive sung lullaby, including its pitch level, are part of the infants' long-term representation of musical pieces that are meaningful to them. The use of expressive vocal music reveals abilities that are not evident in the context of synthesised instrumental music (Trehub, 2006).

During 12 to 24 months of age, young children are able to reproduce and remember the order of musical sequences and causal relationships with each other through imitated canonical order (Pouthas, 1996). By 28 months of age, they can correctly reproduce sequences in an inverse order. At the end of the third year of life, children begin to represent order in an abstract manner. They start to correctly reproduce random musical sequences through imitation (Pouthas, 1996).

Vocalisation

When babies are born, they are capable of detecting small differences in vocal sounds and making sense of the music and languages of any culture. In the first month of life, infants' vocalisations relate to the communication of their distress or comfort which are driven by basic human needs. Infants learn to produce fundamental voicing and their vocalisations are 'constrained by the limited structures and behavioural possibilities of the developing vocal system' (Welch, 2005, p. 263). This kind of voicing is also called by Papoušek (1996) as 'quasi-resonant sounds' (p. 104).

Babies from one to six months begin gurgling and cooing (Crain, 1992). They make babbling sounds such as 'baba' and 'dada'. During the first two to three months, the disposition of infants' vocal sounds develop from 'brief grating or harsh sounds to longer euphonic musical sounds approximating pure, harmoniously voiced tones' (Papoušek, 1996, p. 48). Around two to four months, infants tend to generate

quasi-melodic vocal sounds. From four to seven months, their ability to control their vocal sounds increases. From two to seven months, 34 to 53 percent of infants' preverbal vocal communication is part of reciprocal matching sequences through the mothers' modeling and matching utterances (Papoušek, 1996). Around nine months to one year, infants begin to sing spontaneously with a wide pitch range (Welch, 2005). In their first year of life, infants engage in vocal play and babbling which form the foundation of comprehension for musical singing.

During the first year of life, infants use crying, babbling, facial expressions and bodily gestures to communicate their emotions to others. Between the age of one to two years, infants' singing shifts from spontaneous vocalisation to repetition of brief phrases and various pitch centres of melodic contours (Welch, 2005). Papoušek (1996) identified six stages of infants' vocal production and during the first year of life it is featured by increasing diversity in vocal activities (see Table 3.1). In these phase-based models of musical development, Welch (2005) noted that there are considerable differences between individuals depending on their maturation, experience, task and context. The following table presents the summative identification by researchers (Papoušek, 1996; Welch, 2006) of infants' vocal development:

Time (months)	Vocal development
0 – 1	Phonation (Papoušek, 1996, p. 103); communication of affective state (Welch, 2006, p. 314)
2 – 3	Melodic modulation and primitive articulation in cooing (Papoušek, 1996, p. 104); quasi-melodic features (Welch, 2006, p. 314)
4 – 6	Exploratory vocal play (Papoušek, 1996, p.104); developing vocal control (Welch, 2006, p. 314)
7 – 11	Repetitive babbling (Papoušek, 1996, p. 104)
9 – 13	Variegated babbling and early words (Papoušek, 1996, p. 104)
12 – 18	The one-word stage (Papoušek, 1996, p. 104)

Table 3.1: Summary of infants' vocal and speech development

In order to reproduce children's songs accurately, different musical skills are required. Pauthas (1996) listed the musical abilities that young children need to possess in order to sing these songs, which include:

- the accurate singing of pitches with respect to the underlying tonality;
- the ability not only to reproduce the surface aspects of rhythm, but also to be able to relate these to the underlying rhythmic pulse;
- the mastery of song forms, which includes repetition, variation and development (p. 162).

3.3.5 Social interaction - Interactive vocal play

Communication between caregivers and infants has particular characteristics of 'high pitch register, sustained vowels, rhythmic quality, repetitiveness, and expanded pitch contours' (Trehub, 2006, p. 38). Most infants experience music-like input from pleasant sounding speech or singing in conjunction with visually pleasing manual and facial gestures from their mothers (Papoušek, 1996). Infants have greater attentiveness and positive affect in responding to infant-directed speech and singing (Trehub, 2006). Trehub (2006) noted several factors which contribute to infant listening preferences. Firstly, it might come from the large pitch range and greater dynamic range in maternal speech with attractive emotional expressiveness. Secondly, the elevated pitch level of infant-directed singing is present from the earliest days of life. Infants seem to prefer and respond to different pitch levels and musical styles depending on their current needs. Finally, maternal singing is thought to regulate infants' arousal or mood.

For the newborns, their awareness of human signals 'while slow and rudimentary, is already comprehensive, multimodal and coherent at birth' (Malloch, 1999, p. 30). This is evident in newborns' reaction to the human voice and hand movements and imitations

of facial expressions and vocalisations. Trehub (2006) noted that infants who have intimate musical experiences with their carers, show enhanced overall well-being and increased interest in music. This interactive vocal play in motherese has a crucial role in early language acquisition and social interaction by having a regulation of pulse, vocal quality and narrative form (Fassbender, 1996; Welch, 2005). A strong intrinsic motivation of vocal practising or vocal play with special capacities for vocal imitation occurred naturally during mother and infant's interaction (Papoušek, 1996).

When carers provide musical stimulation directly to infants, the infants give feedback cues and thus form a close musical interaction. The musical interaction also needs to be easy enough for infants to predict and participate with playfulness, fun and creativity (Papoušek, 1996). The vocal play can be a wordless song or imitative, rhythmic and repetitive sounds which are attended to and responded to by infants. The babies cannot understand the meaning of the words and they answer back in 'gliding–type' sounds, as Malloch (1999) noted 'the communication must be held by means other than lexical meaning, grammar and syntax' (p. 29).

Parents' sensitivity in responding to changes in the infant emotional and behavioural state causes them to modify their singing (Lecanuet, 1996; Papoušek, 1996; Malloch, 1999; Trehub, 2006). Through the parents' attunement, they share the joint attending and co-operative performance which lead the infants to understand 'acts of meaning' (Trevarthen, 2002) and language (Papoušek, 1996). The vocal interaction between mother and infants creates an environment which enables the infants to develop their innate ability 'to sense rhythmic time and temporal variation in the human voice' (Welch, 2005, p. 256). Therefore, 'infants can sometimes nicely time their simple coos and squeals so that they take part in a joint performance' (Trevarthen, 2002, p. 23; Malloch, 1999). Malloch (1999) acknowledged that 'an infant at 4 months of age is

quite capable of entering into the "structure" of a musical game with another' (p. 47).

In order to interact with one another understandably, infants seek encouraging communicative forms of signals from their carers but it is more important that the signals are appropriately timed. The co-operative and co-dependent communicative interactions between mother and infant enable them to become musical partners in a musical dialogue. Malloch (1999) reported that the timing of mother and infant's vocal exchange showed a remarkable regularity, co-ordinated and negotiated communication. They exchange their sounds in alternation and by imitating one another. Parents often interact with the infants with the encouragement of duet singing by slowing down the tempo or pausing to allow them to tune in through imitating. Infants are able to incorporate individual musical phrases into their monologues and modify them. They may attempt to join in a song sung by the parent and 'to tune to the pitch, to move in synchrony with the song, or to complement the final note, to echo parts of the tune, or even to anticipate the next phrase' (Papoušek, 1996, p. 106).

To conclude, infants who experience a more responsive environment make faster social and cognitive progress and this is the same for children and young people with complex needs (Marvin, 1998). Marvin (1998) claimed that

> 'it has been found that these students receive only very few responses to their attempts to communicate and express choices...where educators are trained to recognise their pupils' attempts to communicate and therefore the pupils receive higher levels of response they communicate intentionally more often. This not only highlights the importance of the skills of individual professionals in promoting and recognising attempts to communicate but also of the staff team working together in the classroom alerting each other to the communicative intentions of their pupils' (p. 125-126).

3.4 Summary

This chapter served as an attempt to review contemporary literature on the development of foetal and infants' musical capacities, which may relate to the very beginning of human communication, cultural integration and early musicality. In addition, early musical development of infants' and the young children's reaction and interaction with sounds and music may provide new insights into the musical behaviours and development of children and young people with complex needs.

This chapter focused on mapping the musical development from prenatal to the first years of life. The early musicality and capabilities of foetus and infancy provided some evidence for mapping the musical behaviours and development of the children and young people with complex needs. As children and young people with complex needs have severe global developmental delay, they may in certain areas function as though they are still in early stage of life. However, the life experiences of children and young people with complex needs may still not be the same as typical infants or young children. This is due to their chronological ages, the time they spent in a musical environment and the musical experiences they had received. As the wide range of disabilities hindered these children's learning and outcome behaviour, their developmental file may have uneven musicality when compared with a typical child's development. In the next chapter, we will see that because of the uneven profile of these children, the design of *SoI* framework (see Chapter 4) extends the musical development profile to early teenage years.

Chapter 4

Musical development in the context of special needs and special education

4.1 Introduction

The nature of the children's complex needs is often highly individual and until very recently there have been no published protocols available for observational assessment in music. In 2001, the UK government launched the 'P-levels' music curriculum and assessment for children and young people with complex needs. The then Qualifications and Curriculum Authority (QCA) claimed that the Performance Descriptions in the P-levels are sufficient for music practitioners to assess children's performance levels, plan the curriculum, track progress and record development over a period of time (QCA, 2001). However, due to the lack of evidence-based empirical research to underpin the foundation for P-levels, Ockelford (2008) and Welch *et al.* (2008) launched the *Sound of Intent* (*SoI*) project to develop a musical assessment framework, *SoI* theoretical framework (see section 4.4), as an alternative foundation for the music curriculum and assessment for children and young people with complex needs.

The current research utilises the second version of the *SoI* theoretical framework to further develop a new assessment procedure (see Chapter 6) to assess, collect, organise and analyse the empirical data of three students' musical behaviours and development. As Mertens (2005) noted, the development of theoretical thinking is an essential part of the research design, especially in case study research. Theory provides an understanding of what is being studied and 'the literature review is an excellent source for the identification of appropriate theories to guide the case study design' (Mertens, 2005, p.

240).

In this chapter, section 4.2 reviews the 'PROMISE' report (2001) which is a survey study that sought to find out the nature of music provision in special schools in England. Section 4.3 examines the UK government's P-levels music curriculum and assessment (2001) for children and young people with complex needs. Section 4.4 illustrates the *SoI* theoretical framework (2008) and details its components of configuration.

4.2 The PROMISE report

In order to investigate the nature of music provision in special schools in England that catered for children and young people with SLD or PMLD, Welch *et al.* (2001) undertook a research project, which became known as the 'PROMISE' report. The PROMISE project was funded by the Esmée Fairbairn Foundation[1] and was supported by the then Royal National Institute for the Blind (RNIB). The project was an exploratory study. There were three phases in the project using questionnaire sampling, school visits and informal discussions with teachers and other professionals. A total of 53 schools participated. The evidence gathered from the project suggested that 'there is considerable variation in the quantity and quality of music education and music therapy available to pupils' (Welch *et al.*, 2001, p. 5).

In the course of the PROMISE research, it was noted that there were more than 30,000 children (32%) in special schools in England with SLD or PMLD. The research team generated the working definitions of SLD and PMLD to match general responses from schools (see Chapter 1). These children were to be found in other parts of the special education sector and were educated with others who have other forms of disability.

[1] For more information see http://www.esmeefairbairn.org.uk

Most of the participating schools catered for a broad age range: early years to post-16.

The main findings from PROMISE were:

- all special schools had a designated music coordinator although over half of them had no qualification in music;
- most children received music tuition from their own class teacher;
- approximately one third of schools provided music therapy on site although only about 5% of children were receiving music therapy;
- continuing professional development (CPD) in music education appeared to be ad hoc and depended mainly on local provision;
- the majority of schools based their schemes of work on the National Curriculum for Music and there was no common curriculum framework evident for children with complex needs. (Note: the PROMISE research was done before the 'P-levels' for music appeared – see section 4.3);
- all headteachers were very positive about the benefits of their students engaging in musical activities;
- all schools made extensive use of music and musical activities within the wider curriculum although there was little or no connection with the formal music curriculum;
- the majority of music coordinators stated that musical objectives appeared regularly on most children's Individual Learning Plans (ILP);
- the resources for music varied across schools, with the widespread use of unpitched percussion instruments. This probably reflected the music curriculum being conceived within an early year's framework, and the lack of music professional expertise of the teaching staff;
- the technology used in schools for music largely comprised sound reproduction equipment;

- the linkage of wider community for musical activities was widespread and varied;
- the majority of respondents did not distinguish between attainment and progress in music;
- music is a significant component in the lives of pupils with SLD and PMLD (Welch *et al.*, 2001, p. 5-8).

From the findings that were reported in the PROMISE report, it seems that most headteachers thought that development *through* music is more widely recognised than development *in* music. The PROMISE survey suggested that children and young people participating in musical activities were helped in other areas of development *through* music, including communication skills, concentration, attentive behaviour and emotional regulation. The project also acknowledged the main features of its survey's findings were the lack of an agreed musical curriculum, the wide variation within pupil populations, and the lack of empirically based research data of these children's musical behaviours and development.

The PROMISE report provided a wider context of music provision in special schools across the UK. The research team specified the importance for further research to provide clearer guidance to frame music education for these children. This would need to be done through a coherent and comprehensive set of studies into the musical behaviours and development of children and young people with complex needs in educational settings. The PROMISE project is used to inform part of the ethnographic fieldwork in this research to look into the music provisions in the research site (a special school), which will be presented in Chapter 7.

4.3 P–levels music curriculum and assessment

When the National Curriculum was introduced in 1988, it prescribed ten subject areas. Despite the proclamation that this was 'a curriculum for all', Marvin (1998) claimed that 'it was obvious that no thought had been given to children with special educational needs' (p. 118). Furthermore, for children with complex needs, the 'formal recognition of achievement below Level 1 remains elusive' (Marvin, 1998, p. 125). Therefore, as Marvin (1998) noted that

> 'assessment of progress is often disappointing when conventional assessment devices are used since they fail to take account of the extremely small changes in a child's performance. It is important that staff increase their sensitivity to their pupils' behaviour and work towards becoming masters of observation' (p. 126).

There was no nationally agreed music curriculum for those with complex needs in areas of the development *in* music until relatively recently. The Qualifications and Curriculum Authority (QCA) (2001) published *Planning, teaching and assessing the curriculum for pupils with learning difficulties* to introduce performance descriptions (P-levels) to enable teachers and others, who were striving to meet the needs of children and young people, to observe and record small steps of progress made by these children with SEN (Jaquiss and Paterson, 2005). These children and young people were considered to be functioning 'below' Level 1 of the National Curriculum (Ockelford, 2008).

The QCA's 2001 publication outlined early learning and attainment for each subject in the National Curriculum, including music. In common with the other curriculum areas, music contains 'Performance Descriptions' that chart through eight levels P1 to P8 up to National Curriculum Level 1.

In the first three levels from P1 to P3, the performance descriptions are common across all subjects and correspond to those with profound needs. The performance descriptions 'outline the types and range of general performance that pupils with learning difficulties might characteristically demonstrate' (QCA, 2001, p. 21). Each level is subdivided into two sublevels: P1 (i) and P1 (ii), P2 (i) and P2 (ii) and P3 (i) and P3 (ii). Even though these six performance descriptions are the same across the whole curriculum, different subject-focused examples are added to illustrate some of the ways in which staff might identify attainment in their specific subject's context (QCA, 2001). In the case of music, Table 4.1 lists the examples according to different levels as follows:

Table 4.1 Performance descriptions of the P-levels 1-3 with music examples

Level	Performance descriptions across subjects	Music examples
P1 (i)	Pupils may show simple reflex responses. Any participation is fully prompted.	-startling at sudden noises or movements
P1 (ii)	Pupils may have periods when they appear alert and ready to focus their attention on certain people, events, objects or parts of objects. They may give intermittent reactions	-becoming still in a concert hall -sometimes becoming excited at repeated patterns of sounds
P2 (i)	Pupils react to new activities and experiences They begin to show interest in people, events and objects They accept and engage in coactive exploration	-turning towards unfamiliar sounds -looking for the source of music -being encouraged to stroke the strings of a guitar
P2 (ii)	Pupils communicate consistent preferences and affective responses They recognise familiar people, events and objects They perform actions often by trial and improvement, and they remember learned responses over short periods of time They cooperate with shared exploration and supported participation	-relaxing during certain pieces of music but not others -a favourite song -repeatedly pressing the keys of an electronic key board instrument -holding an ocean drum
P3 (i)	Pupils request events or activities They explore materials in increasingly complex ways They observe the results of their own actions with interest They remember learned responses over more extended periods	-leading an adult to the CD player -tapping piano keys gently and with more vigour -listening intently when moving across and through a sound beam -recalling movements associated with a particular song from week to week
P3 (ii)	Pupils may initiate interactions and activities They can remember learned responses over increasing periods of time and may anticipate known events They may respond to options and choices with actions or gestures They actively explore objects and events for more extended periods They apply potential solutions systematically to problems	-performing an action such as clapping hands to initiate a particular song -a loud sound at a particular point in a piece of music -choosing a shaker in a rhythm band activity -tapping, stroking, rubbing or shaking an instrument to produce various effects -indicating by eye contact or gesture the pupil whose turn it is to play in a 'call and response' activity

From level P4 to P8, the document stated that many believed that it is possible to describe performance in a way that indicates the emergence of subject-focused skills, knowledge and understanding (QCA, 2001). Table 4.2 lists the music examples according to subject performance descriptions:

Table 4.2 Performance descriptions of the P-levels 4-8 with music examples

Level	Performance descriptions in music	Music examples
P4	Pupils are aware of cause and effect in familiar events	-what happens when particular instruments are shaken, banged, scraped or blown, or that a sound can be started and stopped or linked to movement through a sound beam
P5	Pupils respond to signs given by a musical conductor They pick out a specific musical instrument when asked	-to start or stop playing -a drum or a triangle
P6	Pupils begin to categorise percussion instruments by how they can be played	-striking or shaking
P7	Pupils listen to music and can describe music in simple terms They make simple compositions	-describing musical experiences using phrases or statements combining a small number of words, signs, symbols or gestures. -by choosing symbols or picture cue cards, ordering them from left to right, or making patterns of sounds using computer software.
P8	Pupils understand and respond to words, symbols and signs that relate to tempo, dynamics and pitch They use a growing musical vocabulary of words, signs or symbols to describe what they play and hear They make and communicate choices when performing, playing, composing, listening and appraising	-faster, slower, louder, higher and lower -fast, slow, high, low -prompting members of the group to play alone, in partnerships, in groups or all together

The QCA's document claimed that teachers can use the 11 Performance Descriptions in the same way as the National Curriculum level descriptions to decide the pupils' performance level, develop assessment and long- to short-term planning, track linear and lateral progress, and record pupils' overall development and achievement over a period of time and in different contexts (QCA, 2001).

Despite the QCA's claim on the function of the P-levels and the representativeness of these musical examples, Ockelford (2008) criticised their claims and raised several serious issues within the P-levels. He questioned the evidence that was used to form the basis of the P-levels and asserted that its construction was unclear. The short list of examples given for P1 to P8 in the above two tables suggests the lack of empirical foundation and systematically derived research to back up the P-level's music curriculum design and assessment. These musical examples also have no mention of

vocalisation or vocal interaction, which is considered to be one of the most prominent features in early musical development (Welch, 2006). It is thus difficult to see how these examples can be representative.

When looking at the content and structure of the P-levels, Ockelford (2008) claimed that the P-levels overlooked the following issues:

- the discontinuity from generic performance descriptions (up to P3) to subject-focused descriptors (from level 4 onward);
- the ambiguous nature of descriptors across different levels;
- difficulties in making music conform to a general developmental path;
- confusing musical elements and non-musical elements: the so-called 'music' examples given in the P-levels only partially pertain to attainment in music.

Ockelford (2008) noted that 'it appears that this conceptual blending has arisen from an ignorance of what musical development actually comprises, and, paradoxically, has tended to limit an appreciation of music's true capacity to inform wider learning and development' (p. 111). The mixture of musical and non-musical elements in the 'P-levels for music' also seemed to coincide with the headteachers' perceptions and attitudes towards music for children with complex needs which was noted in the PROMISE report (2001).

In addition, Welch *et al.* (2008) claimed that the P-levels for music had not apparently helped practitioners' recognition of attainment and progress for such children in the earliest stages of musical development. The major weakness of the 'P-levels' is that they are not rooted in musical development research of children and young people with complex needs.

4.4 The *SoI* theoretical framework

The difficulties that the P-levels encountered stimulated the process of charting an alternative route for the musical development for children who had complex needs. From the late 1990s, a group of researchers tried to map out the musical development path, music curriculum and assessment for children with complex needs using empirical data. The research project is known as the *Sounds of Intent* (*SoI*) project, which started at the Institute of Education as part of a series of studies involving music and special education and following on from the PROMISE research.

The core research team members of the PROMISE project and the *SoI* had been exploring the nature and significance of music in the lives of children and young people with learning difficulties (Welch, *et al.*, 2008; 2009). The PROMISE report attempted to 'place music education in a broad and realistic context, and to gauge its potential relevance to children [with SLD or PMLD] throughout the school day and beyond' (Welch *et al.*, 2001, p. 14) and this provided the impetus for the '*Sound of Intent*' project.

The *SoI* framework attempted to combine (a) findings from 'mainstream' developmental music psychology (e.g. Fassbender, 1996; Lecanuet, 1996; Papoušek, 1996), (b) Ockelford's 'zygonic' theory of how music makes sense to people (e.g. Ockelford, 2005; 2006) and (c) recently completed exploratory empirical research into musical behaviours in children and young people with complex needs (Ockelford *et al.*, 2002; 2004; 2005; Ockelford, 2008; Welch *et al.*, 2008; 2009).

4.4.1 The *SoI* framework – Phase 1: a PMLD focus

Following the completion of the PROMISE survey, the research team set out to gather evidence by directly observing children and young people with complex needs, in order to model their musical development. Part of the project's activities was funded by the Esmée Fairbairn Foundation and RNIB from 2005 to 2007. The new research team also involved a group of practitioners (music specialists and non-specialists) to participate in the *SoI* project (Ockelford, 2008). These music practitioners were drawn from a national conference in London where the PROMISE report was discussed (Welch *et al.*, 2008).

In phase 1, the *SoI* project aimed to investigate how children with PMLD engage with music and was designed to explore the musical abilities and developmental needs of these children. The *SoI* framework offered a common platform for the exchange of ideas about communication and interaction through sound in different disciplines. It also set out to offer a broad curricular outline to inform the development of schemes of work and other planning and as a tool for assessment, recording and organising resources for children and young people with PMLD.

Initial data collection and analyses were carried out. The research team analysed video recordings of their own and each other's pupils in detail. They also undertook direct observations in one another's classrooms. Ockelford (2008) observed that 'the children's responses, actions and interactions were carefully noted, and attempts were made to gauge which could be reasonably considered to be representative of musical attainment or progress' (p. 75). The first version of *SoI* framework was then generated. Even though there were no longitudinal data available for these children, it was felt by the *SoI* research team that this initial model could be used to inform longer-term empirical work as well as being informed by it.

Subsequently, funding was awarded by the Esmée Fairbairn Foundation for a more sustained school based study (Welch *et al.*, 2008). In the first year (2005-2006), a series of visits was conducted over two terms in order to gather observational data with 68 pupils while engaging with music in five special schools. There were a total of 630 observations in this first phase of the project. The *SoI* research team reported that the children and young people with PMLD seemed to react to music according to the basic qualities of the sounds such as high and low, loud and soft, quick and slow. This coincided with the first few months of an infant's musical development stage in maternal vocalisation (Welch *et al.*, 2001; Ockelford, 2008). There was also a developmental relationship between the children's awareness of sound structure and their capacity to respond to it. It was observed by the *SoI* team that some young people with complex needs developed a preference for repetition and the capacity to anticipate changes in pitch, loudness, tone colour, or tempo, based on their previous hearings of a short piece. Some of them also seemed to react to music as it stimulated memories of emotional and intuitive experiences with which they were previously associated.

The *SoI* PMLD framework was first designed in two dimensions as 'reactive', which means 'listening and responding to musical stimuli' and 'proactive', which denotes 'causing, creating, and controlling music and musical sounds'. The third dimension for the framework was 'interactive' which refers to 'listening to sounds and making them occur in the context of participation with others' or actual 'communication' (Ockelford, 2008, p. 77). This new dimension emerged later through discussion with practitioners on how they used music and how this might be conceptualised using the *SoI* framework.

The research team then identified five broad levels of attainment as key stages in the recognition and understanding of musical development that children with PMLD were likely to follow. The 'typical' early musical development was used as the basis to map

out the *SoI* framework. To reflect the nature of the observations, the design of *SoI* framework for the three domains are listed below (see Tables 4.3, 4.4 and 4.5):

Table 4.3 Version 1 reactive domain of the *SoI* framework

Reactive domain	Levels of attainment (Ockelford, 2008, p. 83)	Corresponding to 'typical' development (Ockelford, 2008, p. 78-79)
R1	'encounters sounds'	four to five months prior to birth and earlier before the hearing system is matured.
R2	'shows awareness of sound and silence'	four to three months prior to birth and later.
R3	'attends and responds to a variety of sounds'	the first few months after birth.
R4	'attends and responds to simple patterns in sound'	two-and-a-half to five months after birth.
R5	'makes distinct response to familiar short pieces, fragments or features of music and/or anticipates clear contrast within a familiar piece'	from the age of seven to 11 months.

Table 4.4 Version 1 proactive domain of the *SoI* framework

Proactive domain	Levels of attainment (Ockelford, 2008, p. 83)	Corresponding to 'typical' development (Ockelford, 2008, p. 80)
P1	'makes sounds accidentally'	when movement appears in foetal life.
P2	'makes sounds intentionally'	from birth.
P3	'makes a variety of sounds'	from four to six months after birth.
P4	'produces simple patterns by repeating sounds'	from four to six months after birth.
P5	'repeats short groups of sounds, which may incorporate recognisable fragments or features of music'	from between seven and 11 months.

Table 4.5 Version 1 interactive domain of the *SoI* framework

Interactive domain	Levels of attainment (Ockelford, 2008, p. 83)	Corresponding to 'typical' development (Ockelford, 2008, p. 80)
I1	'chance interactions'	from birth.
I2	'makes sound in response to external stimulus and/or to stimulate a response'	from birth.
I3	'takes turns, neither copying what is heard nor reacting differently if own sounds are copied'	from two months onwards.
I4	'takes turns, copying individual sounds that are heard and/or relishing own sounds being copied'	from two months onwards.
I5	'takes turns, copying short patterns in sound and/or anticipating own short patterns being copied'	from 12 months onwards or before.

From the *SoI* framework theoretical point of view, the intentionality in sound production would go after the development of an awareness of sound. Therefore, proactive domains tend to appear after the equivalent reactive stages. The interactive domains draw on elements from the reactive and proactive strands and they only occur alongside or after the equivalent proactive and reactive stages.

While assessing children and young people with complex needs, Ockelford (2008) wrote that

> 'Yet the reality is, depending on the nature of their medical condition and its functional implications, that some pupils with PMLD will change, developing new skills and abilities, knowledge, and understanding; some will stay much the same, retaining what they have; while the capacities of others will wane, irrespective of the external input they are given. But, depending on a pupil's personal circumstances, each state may be equally valid. It is the quality of the educational experience in enabling potential to be maximized that the *Sounds of Intent* research team felt was the important thing' (p. 81).

In presenting the figure of the *SoI* framework, the research team developed a series of concentric circles to situate the three domains of engagement with music in five developmental levels in version 1 (see Fig. 4.1). Each level had a descriptor to summarise a particular experience or ability related to musical development for PMLD children (see Fig. 4.2). Ockelford (2008) acknowledged that 'the framework is a gross conceptual simplification of a highly complex area of human activity: it could only function as a model by being selective and summative' (p. 82).

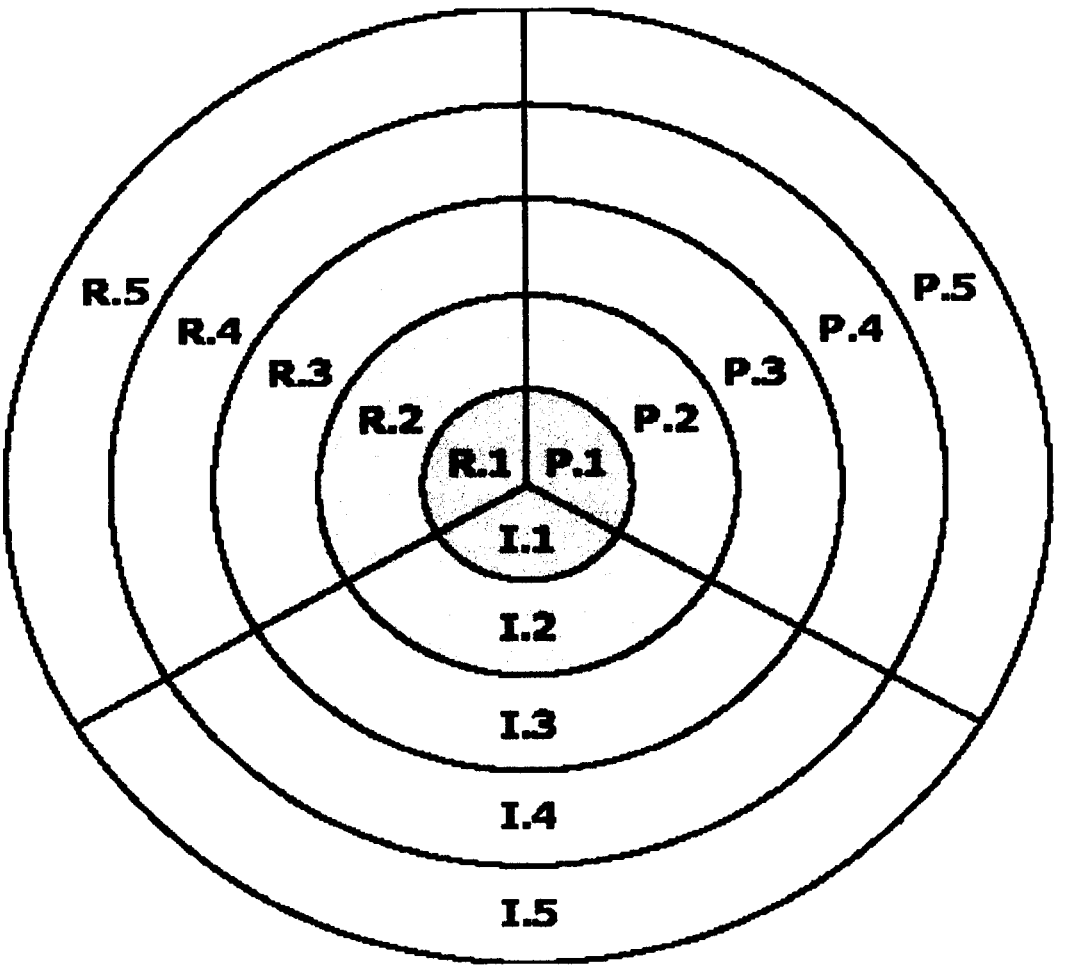


Fig. 4.1 Summary of the domains and levels in the *SoI* framework, version 1 for PMLD pupils

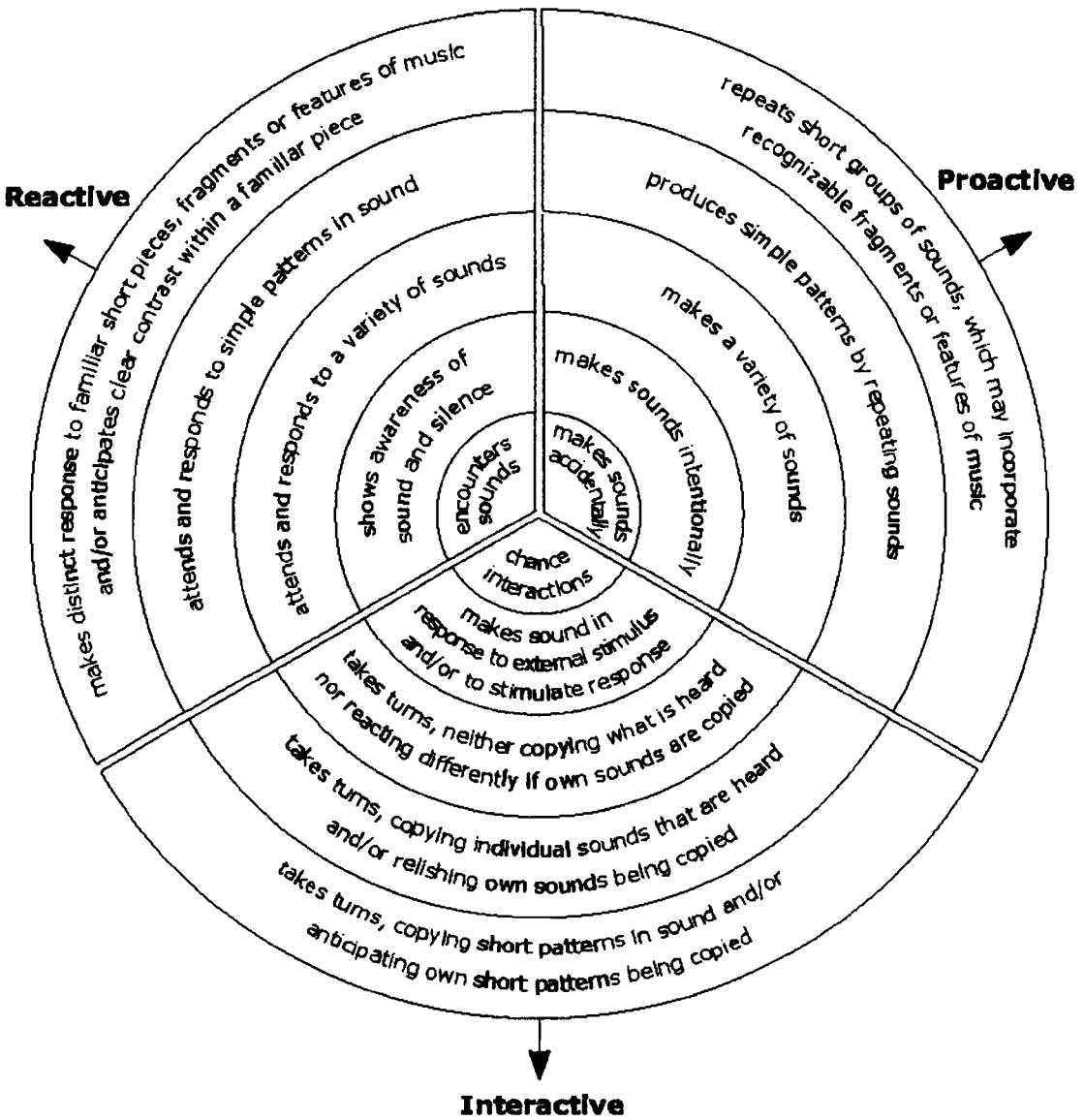


Fig. 4.2 The *Sounds of Intent* framework, version 1 for PMLD pupils

4.4.2 The *SoI* framework – Phase 2: an SLD and PMLD focus

While evaluating the first version of the *SoI* framework, the research team found several issues that needed to be taken into account to improve and extend the *SoI* framework. Firstly, more detail was needed on the headlines to provide better understanding of each level of attainment. Secondly, there was a need to modify the label wording in reactive, proactive and interactive domains to fit the fieldwork observations better. Finally, the framework should be expanded to encompass the abilities and experiences of children and young people with SLD, whose musicality may be highly developed by any

standards (Ockelford, 2008, p. 88). The 630 observations made in five schools during the first phase of the *SoI* research were re-profiled and along with further observations with pupils, who have SLD and PMLD, of their engagement with music. The second version of *SoI* framework was then generated.

The second version of *SoI* framework level 2 integrated first version's levels 2 and 3, and the second version's level 3 had previously been the first version's level 4. To extend the model to include children and young people with SLD, a further three broad levels of attainment were hypothesised and designed to include levels that corresponded to 'typical' development (Moog, 1976; Hargreaves, 1986; Swanwick and Tillman, 1986; Swanwick, 1991; Marshall and Hargreaves, 2005) from age 7 months to early teenage years in the second version of *SoI* framework (see Tables 4.6, 4.7 and 4.8). Finally, some of the headings were modified to give a better integration with the observations. Tables 4.6, 4.7 and 4.8 illustrate the second version of the *SoI* framework.

Table 4.6 Version 2 reactive domain of the *SoI* framework

Reactive domain	Levels of attainment (Ockelford, 2008, p. 96)	Corresponding to 'typical' development (Ockelford, 2008, p. 78; p. 94)
R1	'encounters sounds'	four to five months prior to birth and earlier
R2	'shows emerging awareness of sound'	from four to three months before birth to the first few months after birth
R3	'recognizes and reacts to simple patterns in sound'	two-and-a-half to five months after birth
R4	'responds to groups of musical sounds and the relationships between them'	from the age of 7 to 11 months onwards.
R5	'attends to pieces, recognizing prominent structural features and responding to characteristics with learnt connotations'	from the age of 4 or 5 years.
R6	'engages with pieces as narratives in sound which unfold over time to create meaning; differentiates between performances'	from the early teenage years.

Table 4.7 Version 2 proactive domain of the *SoI* framework

Proactive domain	Levels of attainment (Ockelford, 2008, p. 96)	Corresponding to 'typical' development (Ockelford, 2008, p. 80; p. 95)
P1	'makes sounds unknowingly'	the early stages in foetal development when movement becomes possible
P2	'causes, creates or controls sounds intentionally'	from birth to six months after birth
P3	Intentionally makes patterns in sound through repetition or regularity'	four to six months after birth
P4	'creates or re-creates short groups of musical sounds and links them coherently'	from the age of 7 to 11 months.
P5	'performs or improvises music of growing length and complexity, increasingly 'in tune' and 'in time'	from the age of 4 or 5 years.
P6	'seeks to communicate through music, through expressive performance or by creating pieces that are intended to convey particular effects'	from the early teenage years.

Table 4.8 Version 2 interactive domain of the *SoI* framework

Interactive domain	Levels of attainment (Ockelford, 2008, p. 96)	Corresponding to 'typical' development (Ockelford, 2008, p. 80; p. 95)
I1	'unwittingly relates through sound'	from birth
I2	'interacts with another or others using sound'	from birth to two months onwards
I3	'interacts by imitating others' sounds or recognizing self being imitated'	from two months onwards
I4	'engages in musical dialogues, creating and recognising coherent connections between groups of sounds'	from the age of 7 to 11 months.
I5	'performs or improvises music of growing length and complexity with others, using increasingly developed ensemble skills'	from the age of 4 or 5 years.
I6	'makes music expressively with another or others, with a widening repertoire in a range of different styles and genres'	from the early teenage years.

The concentric representation of the second version of *SoI* framework on the musical abilities of children and young people with SLD and PMLD is shown in Figure 4.3. The three domains of musical engagement were developed into six levels in the second version of *SoI* framework. Each level was a necessary forerunner or successor to another based on the notion of contingency and the theories of 'typical' musical development. The progress was moving from inner to the outer rings.

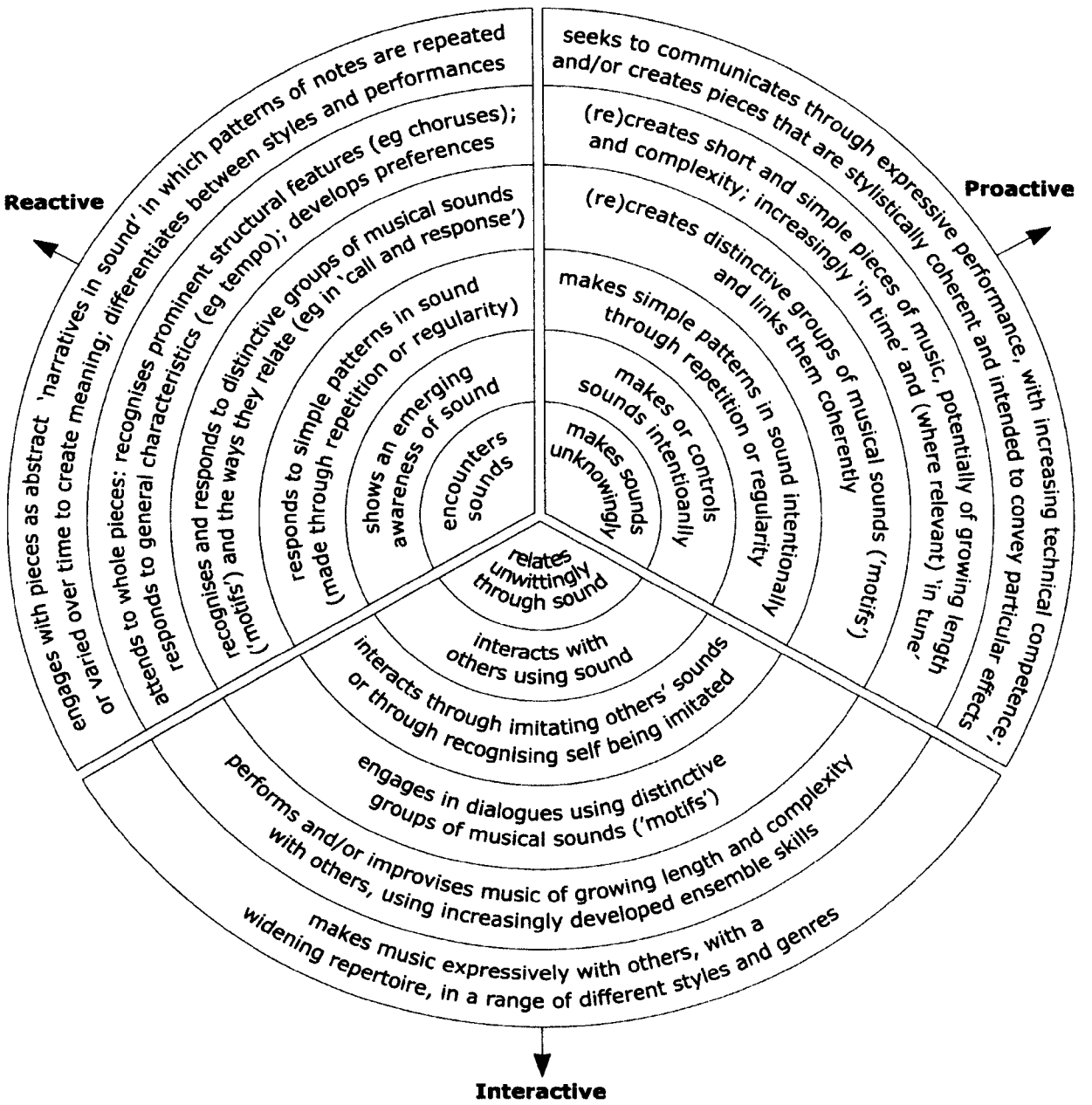


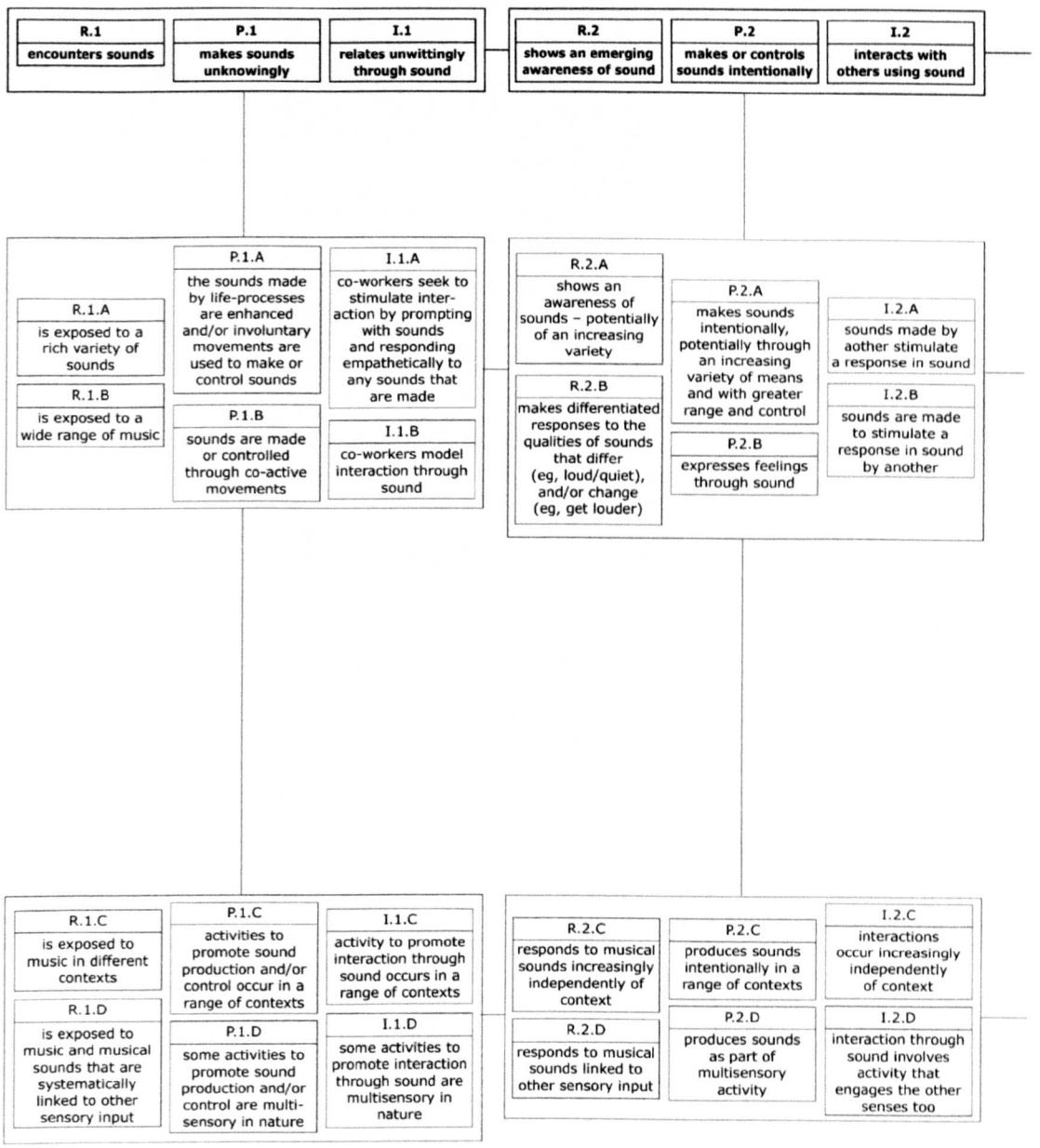
Fig. 4.3 The *Sound of Intent* framework, version 2 for SLD and PMLD pupils

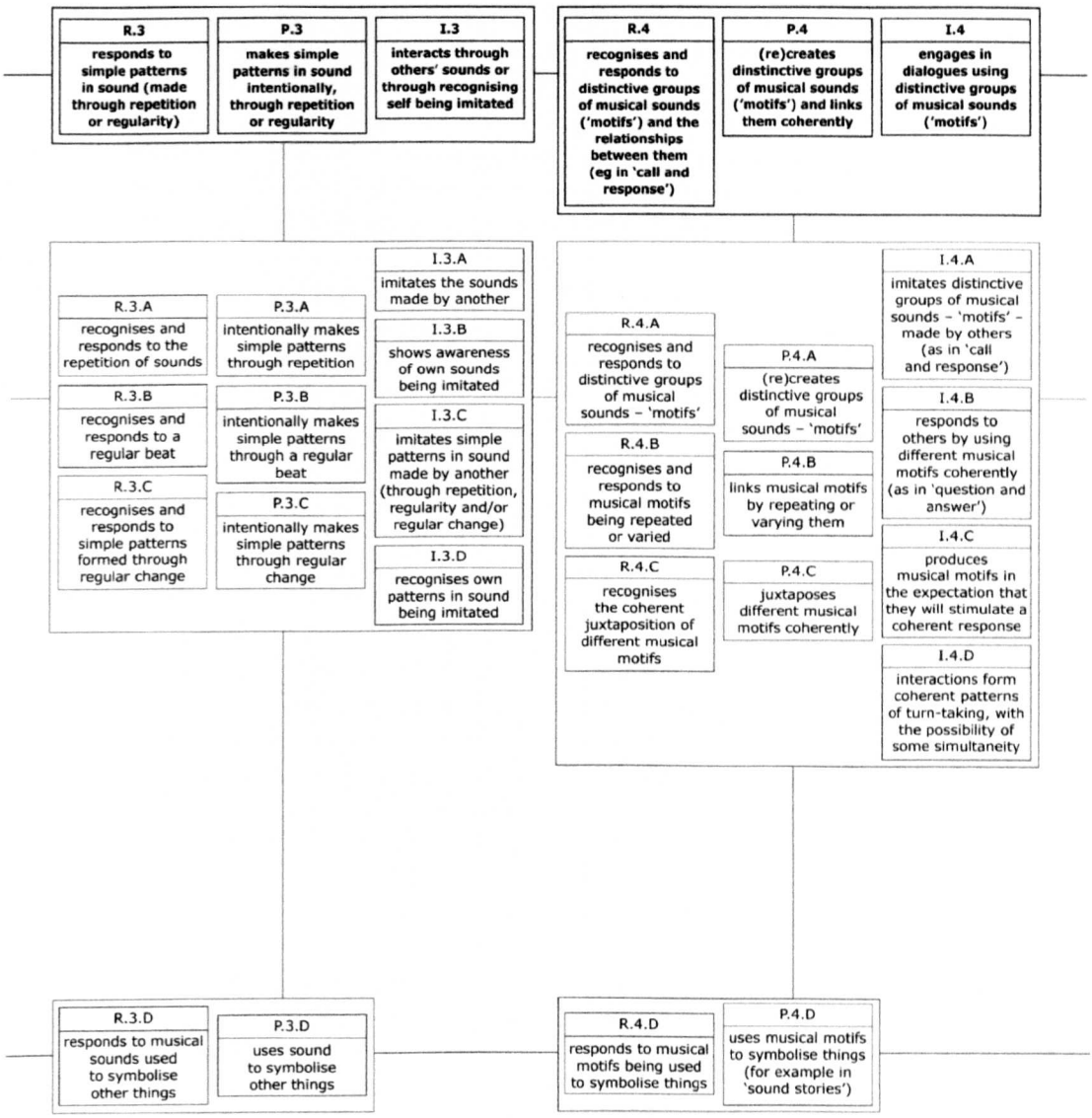
For each level in every domain, there are four further elements which serve as examples for the researcher to identify various musical engagements into relevant levels. Since there are six levels and three domains, the total number for elements is 72 (see Fig.4.4).

The *SoI* research team also designed shaded areas to present different segment headings. The majority of the elements pertain purely to sound and music. Some elements pertain to sound and music being perceived or produced in other sensory contexts, or related to

other things. Two elements (P.5.D and P.6.D) refer to a young person's developing technical capacity to perform music (see Appendix A for the colored version). The 630 classroom observations were also used to support the elements' identification and verification in the model. Welch *et al.* (2008) stated that,

> 'All development is fuzzy and complex and contextually bound. The new framework [*SoI* framework] is designed to be indicative – to show possible locations and subsequent trends – that may potentially be useful to practitioners as they consider how best to support their pupils' and clients' engagement with music over time...Practitioners should expect profiles of ability and interest to vary in different contexts: it is the long-term trends that are likely to be most valuable in planning appropriate future provision' (p. 7).


R.1
encounters sounds
P.1
makes sounds unknowingly
I.1
relates unwittingly through sound
R.2
shows an emerging awareness of sound
P.2
makes or controls sounds intentionally
I.2
interacts with others using sound
R.1.A
is exposed to a rich variety of sounds
R.1.B
is exposed to a wide range of music
P.1.A
the sounds made by life-processes are enhanced and/or involuntary movements are used to make or control sounds
P.1.B
sounds are made or controlled through co-active movements
I.1.A
co-workers seek to stimulate inter-action by prompting with sounds and responding empathetically to any sounds that are made
I.1.B
co-workers model interaction through sound
R.2.A
shows an awareness of sounds – potentially of an increasing variety
R.2.B
makes differentiated responses to the qualities of sounds that differ (eg, loud/quiet), and/or change (eg, get louder)
P.2.A
makes sounds intentionally, potentially through an increasing variety of means and with greater range and control
P.2.B
expresses feelings through sound
I.2.A
sounds made by aother stimulate a response in sound
I.2.B
sounds are made to stimulate a response in sound by another
R.1.C
is exposed to music in different contexts
R.1.D
is exposed to music and musical sounds that are systematically linked to other sensory input
P.1.C
activities to promote sound production and/or control occur in a range of contexts
P.1.D
some activities to promote sound production and/or control are multi-sensory in nature
I.1.C
activity to promote interaction through sound occurs in a range of contexts
I.1.D
some activities to promote interaction through sound are multisensory in nature
R.2.C
responds to musical sounds increasingly independently of context
R.2.D
responds to musical sounds linked to other sensory input
P.2.C
produces sounds intentionally in a range of contexts
P.2.D
produces sounds as part of multisensory activity
I.2.C
interactions occur increasingly independently of context
I.2.D
interaction through sound involves activity that engages the other senses too


R.3
responds to simple patterns in sound (made through repetition or regularity)
P.3
makes simple patterns in sound intentionally, through repetition or regularity
I.3
interacts through others' sounds or through recognising self being imitated
R.4
recognises and responds to distinctive groups of musical sounds ('motifs') and the relationships between them (eg in 'call and response')
P.4
(re)creates dinstinctive groups of musical sounds ('motifs') and links them coherently
I.4
engages in dialogues using distinctive groups of musical sounds ('motifs')
R.3.A
recognises and responds to the repetition of sounds
R.3.B
recognises and responds to a regular beat
R.3.C
recognises and responds to simple patterns formed through regular change
P.3.A
intentionally makes simple patterns through repetition
P.3.B
intentionally makes simple patterns through a regular beat
P.3.C
intentionally makes simple patterns through regular change
I.3.A
imitates the sounds made by another
I.3.B
shows awareness of own sounds being imitated
I.3.C
imitates simple patterns in sound made by another (through repetition, regularity and/or regular change)
I.3.D
recognises own patterns in sound being imitated
R.4.A
recognises and responds to distinctive groups of musical sounds – 'motifs'
R.4.B
recognises and responds to musical motifs being repeated or varied
R.4.C
recognises the coherent juxtaposition of different musical motifs
P.4.A
(re)creates distinctive groups of musical sounds – 'motifs'
P.4.B
links musical motifs by repeating or varying them
P.4.C
juxtaposes different musical motifs coherently
I.4.A
imitates distinctive groups of musical sounds – 'motifs' – made by others (as in 'call and response')
I.4.B
responds to others by using different musical motifs coherently (as in 'question and answer')
I.4.C
produces musical motifs in the expectation that they will stimulate a coherent response
I.4.D
interactions form coherent patterns of turn-taking, with the possibility of some simultaneity
R.3.D
responds to musical sounds used to symbolise other things
P.3.D
uses sound to symbolise other things
R.4.D
responds to musical motifs being used to symbolise things
P.4.D
uses musical motifs to symbolise things (for example in 'sound stories')

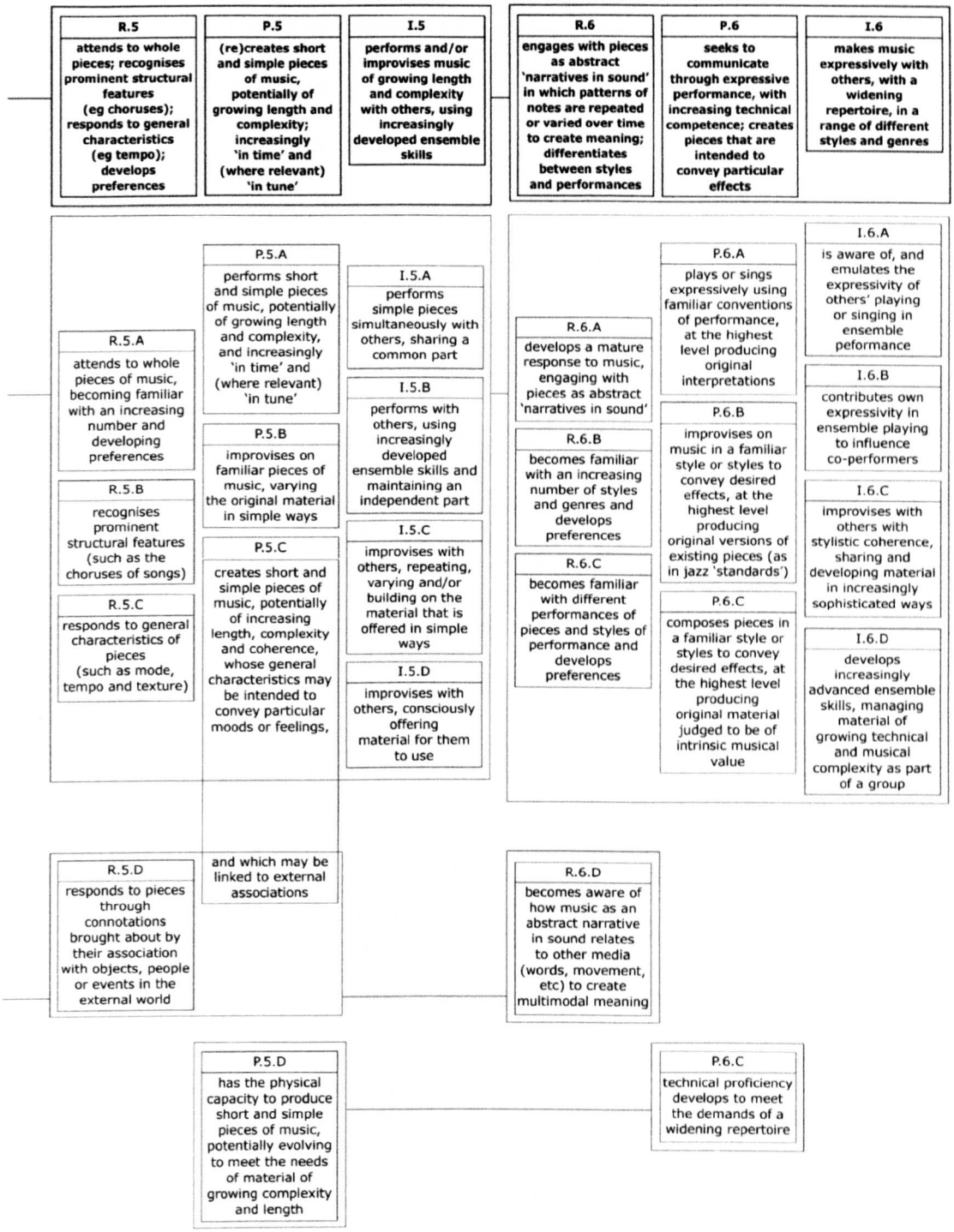


Fig. 4.4 The second version of *SoI* framework with exemplar elements

Ockelford (2008) noted that the *SoI* framework accommodated the data gathered to date within an internally coherent theoretical framework. It was very complex in the ways that level descriptors and elements related to each other within and between the three domains. The achievement at higher levels was dependent on the accomplishment of all those that precede. The pattern of contingencies that linked the 72 elements reflected the

intricate nature of musical development which was 'multi-layered and multi-stranded, with many irregularities' (Ockelford, 2008, p. 105).

4.5 Summary

Music provision in special schools was surveyed through the PROMISE report with various findings concerning qualification of the music practitioners, music provision in class and in school, music curriculum, headteachers' views on the benefit of music for children who have complex needs, music objectives in children's ILP, music resources and community link. The report also emphasised that music was a significant component in the lives of pupils with SLD and PMLD. The result of the PROMISE report is used to inform the ethnographic fieldwork in this research when investigating the music provision in the research site – a special school (see Chapter 7).

In the music planning, curriculum and assessment for children with complex needs, the QCA published performance descriptions 'P-levels' for music in 2001. However, due to several difficult issues in the P-levels, a research team produced another route to assess these children's musical development based on a study called the *Sounds of Intent* (*SoI*) project. The *SoI* framework was designed and revised into a second version. In contrast to the P-levels for music, the *SoI* framework focused on the development of musical interests, abilities and preferences only.

Three domains of musical engagements were presented through a series of concentric circles in the *SoI* framework. Each domain had six levels to depict different attainment statements/ability or a particular level of experience and important contingent relationships between them. The *SoI* framework tried to portray the notion of growth 'of expanding from a small inner core of self to a wider world of other' (Ockelford, 2008, p.

81) and sought to build a musical assessment protocol for children with complex needs.

In the current study, the researcher utilises the second version of the *SoI* framework (see Fig. 4.3 and 4.4) as the main theoretical framework for mapping the three students' musical behaviours. The researcher also adopts the *SoI* theoretical framework as the basis to further develop a new assessment procedure (see Chapter 6) to assess the musical behaviours and development of children and young people with complex needs (see Chapters 8 to 10).

Chapter 5

Research methods

5.1 Introduction

This chapter presents the research questions and the rationale, the research strategies adopted, and the relative positioning of this research within the current broad *SoI* research programme.

Due to the lack of research concerning musical behaviours and development of children and young people with complex needs, the researcher decides to focus on the investigation and evaluation of the musical behaviours and development of these children and young people, and the research questions are designed accordingly.

This research, which is the first in its kind, intends to fill the current research gap by focusing on multiple case studies (three cases in total) through direct longitudinal observations, which hitherto have not been undertaken.

Research strategies are integrated from three dimensions: (1) a theoretical framework from the *SoI* framework (see Chapter 4), (2) an operational tool through the creation of a new assessment procedure (see Chapter 6), partially based on the *SoI* theoretical framework, to assess and analyse the musical behaviours of children and young people with complex needs, and (3) the case study approach as the overall methodological framework, with embedded ethnographic fieldwork to gather detailed contextual background information on the research site.

This study follows a systematic research process to ensure the quality and validity of the data gathering and analyses, and several issues in relation to the research methodology are also addressed such as the role and stance of the researcher, the selection of fieldwork site and cases, ethical issues, and reliability and validity of this research.

5.2 Research questions

As mentioned in Chapter 1, despite the recognition of the value of music for this client group, our understanding music education for children and young people with complex needs is still in its early stages (Ockelford, 2008). Currently there is relatively little research undertaken to understand the musical behaviours and development of these children and young people, especially concerning (i) the musical behaviours and development that might be expected of children and young people with complex needs; (ii) the change and development of musical behaviours over time of such children; and (iii) assessment procedures based on a coherent theoretical framework, whereby empirical data could be gathered and analysed.

This situation motivates the researcher to focus on the investigation and evaluation of the musical behaviours and development of these children and young people, and the research questions are designed accordingly to understand the relevant issues pertaining to the focus.

Based on the discussion above, the research questions in this study are:

- Is it possible to systematically assess and evaluate the musical behaviours and development of children and young people with complex needs over a sustained period of time, based on the theoretical framework (*SoI* framework) – and how

could this be done?

- What is the nature of the observed musical behaviours and development of children and young people with complex needs over a given period of time?

To provide answers for these research questions, the researcher integrates research strategies from three dimensions:

1. For the theoretical dimension, the *SoI* framework (see Chapter 4) is used as the theoretical research foundation to pursue these areas of knowledge and answers.

2. For the operational dimension, the researcher creates a new assessment procedure (see Chapter 6), partially based on the *SoI* theoretical framework, to assess, record, and analyse the empirical data of the musical behaviours of children and young people with complex needs. This new assessment procedure can be flexibly used for different research time frames, based on different research needs.

3. Case study approach (see this chapter) is used as the methodological research strategy. The combination of the case study approach and the newly developed assessment procedure intends to focus on the profiles of observed musical behaviours and development for the three students over a period of time (ranging from eight to 13 months) and to draw comparisons between different cases in the observational setting. These three case studies themselves also exemplify how to operate the new assessment procedure.

4. Finally, in order to increase the comprehensiveness of the case studies in this research, ethnographic fieldwork (see this chapter) is also undertaken, as an embedded sub-method within the overall case study approach, to gather detailed contextual

background information on the research site, including demographic information of the children and the nature of music provision at the school and in the homes.

5.2.1 The positioning of this research within the current broad *SoI* research programme

Different research, which used the *SoI* as theoretical framework, can be largely categorised by the nature of data and the number of participants when applying the *SoI* framework. Generally speaking, data can come from two different sources. One is from direct subject data and the other is from indirect subject data. On the one hand, direct subject data is based on observation where researcher(s) visit field site(s) and record children's musical behaviours. This type of information is gathered directly from watching and listening to the children, and comprises audio and video recordings and field notes. On the other hand, the indirect subject data is based on data that does not involve direct observation of the children. This type of information can be gained from other sources which may include documentation, survey, questionnaire, detailed interviews or discussions with teachers, TAs, parents or any other professionals who have worked closely with these children.

Apart from the distinction between direct and indirect subject data, the number of the participants that researchers choose to investigate can also be divided into two different categories. One has a small number of individuals and the other has a large sample size. Case study research is generally used to provide detailed studies of relatively few participants.

From the above description concerning the number of participants and direct/indirect subject data collection, there are four main options for carrying out research which applies the *SoI* theoretical framework. These four possibilities can be summarised in

Table 5.1. They are:

- Case study based on direct subject data (category 1);
- Case study based on indirect subject data (category 2);
- Large scale study based on direct subject data (category 3);
- Large scale study based on indirect subject data (category 4).

Table 5.1 The four main options for carrying out research which applies the *SoI* theoretical framework

Data collection / Participants' Number	Direct subject data e.g. observation of the children with complex needs	Indirect subject data e.g. documentation or interviews with other people rather than with the children
Small number of individuals, e.g. case study	**1**	**2**
Large sample size, e.g. survey	**3**	**4**

Currently there is no published research in the first and fourth categories, i.e. case study with direct subject data (category 1), or large scale study based on indirect subject data (category 4), using the *SoI* framework to conduct research. In category 2, a study of children with retinopathy of prematurity by Ockelford and Matawa (2009) involved a survey with parents and several case studies, mainly based on indirect subject data. This book followed the previous study of children with septo-optic dysplasia (Ockelford *et al.*, 2006). In category 3, there is a large scale quantitative research based on direct subject data, published by Ockelford (2008) and by Welch *et al.* (2009).

This research is the first longitudinal study through direct observations, using the *SoI* framework, to fill the gap in the first category by focusing on multiple case studies. These multiple case studies will hopefully contribute towards the under-researched areas concerning the musical behaviours and development of children and young people with complex needs, and will help to empirically map out the individual student's

musical development profiles over a period of 13 months.

There are three case studies being carried out in this research. The reason to have more than one case study in this research is mainly to offer opportunity to draw comparisons between different cases in the observational setting, and to increase the overall reliability of this research.

Moreover, within the broad *SoI* research programme, the newly accumulated empirical data and analyses from these multiple case studies might provide feedback on the current *SoI* theoretical research work, including the potential for analytical generalisation on both theory and practice. This might help the future development of the broad *SoI* research programme.

5.3 Research methods

5.3.1 Case study research

Case study research is a way of investigating an empirical topic by following a set of pre-specified procedures, which can be referred to as 'the protocol'. Yin (2003) noted that 'the protocol is a major way of increasing the reliability of case study research and is intended to guide the investigator in carrying out the data collection from a single-case study (again, even if the single case is one of several in a multiple-case study)' (p. 67). The case study protocol covers different stages of the research areas such as the purpose of the study, main issues encountered when conducting the research, conceptual framework, the hypothesis of the study, documentation and management of database, specific research procedure for data collection and analyses, the link between the content of protocol and research questions, and answers to research questions. Neuman (2006) remarked that

> 'Case study uses the logic of analytic instead of enumerative induction. In it, the researcher carefully selects one or a few key cases to illustrate an issue and analytically studies it (or them) in detail. He or she considers the specific context of the case and examines how its parts are configured...Case studies help researchers connect the micro level, or the actions of individual people, to the macro level, or large-scale social structures and processes' (p. 33).

Case study research has the unique strength and the ability to deal with a full variety of evidence, including documents, artifacts, interviews and observations. Yin (2003) wrote that 'when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real life context' (p. 1), case studies can be the preferred strategy in doing social science research. In addition, case studies can be based on any mix of quantitative and qualitative evidence. Case study also focuses and contributes knowledge of a particular individual, group, organisational, social and related phenomena (Robson, 2002; Neuman, 2006; Berg, 2007).

Due to the nature of complex needs and with the high individuality of each child, the case study research is thought to be an appropriate approach to apply in this study. The case study protocol has been developed and used as guidance for the researcher as a standardised agenda. It is used as a research strategy in the research design, data collection, data analyses and reporting. In addition, the case study approach is chosen because it enables more valid inferences to be drawn from the investigation and to help unpack compound elements in the study (Kratochwill, 1992).

In this research, the researcher decides to investigate three cases intensively and to generate rich descriptions of these children and young people, focusing on their musical behaviours and development over a period of 13 months. As Bisesi and Raphael (1995) acknowledged, the case study approach can be used to contribute to the holistic and

evolving understanding of the research enquiry. The case study approach had also been used to compare similarities and differences between multiple cases (Hamel, 1993; Bruscia, 1995; Travers, 2001).

5.3.2 Ethnographic fieldwork

As mentioned in section 5.2, ethnographic fieldwork is embedded within the case study approach in this research to gather contextual background information on the research site, so that the holistic and comprehensiveness of the multiple case studies can be enhanced.

Ethnography is situated within the disciplines of social anthropology and sociology. As Fetterman (1989) defined it, it is a research method designed to describe and analyse practices and beliefs of cultures and communities. Fetterman (1989) also remarked that, 'the ethnographic study allows multiple interpretations of reality and alternative interpretations of data throughout the study' (p. 12). The researcher chose ethnographic fieldwork as an embedded part of the case study approach to provide contextual background. The musical behaviours were investigated in their real-life context. The behaviours and context are considered to be heavily bound together without clearly marked boundaries in the empirical inquiry about the musical behaviours of these children and the musical environment that surround them.

It was also felt by the researcher that a better understanding of the development and behaviours that the music brings into these children's everyday lives could be reached by interacting with them in the natural school music lessons. The ethnographic fieldwork was used to describe music provision practices and to analyse staff's attitudes and beliefs concerning the relationship between music and these children within the school culture. It was aimed to stress a descriptive perspective (Robson, 2002) of the

music provision in the special school (see Chapter 7).

Ethnographic fieldwork was also adopted to give insights into the wider context in which the students' musical behaviours were observed and thus provided valuable context. These included music teaching situations in which the weekly musical development profiles could be mapped for these children, together with types of music-educational practices in the school. The ethnographic fieldwork helped the researcher to cover contextual conditions of the three case studies. In addition, investigation of the research site, utilising the ethnographic approach, was used to contribute to the scarce literature concerning music provisions in special schools.

5.4 The role and stance of the researcher

Neuman (2006) stated that the characteristics of qualitative research reveal social reality and cultural meaning. The interactive processes and events in school life had a dynamic impact with the case children and the relationships between the researcher and these children. The researcher comes from a background of being a music teacher and a music therapist. She has experience over several years of working with children, young people and adults who have learning disabilities and difficulties. By taking on ethnographic fieldwork, the researcher involved herself by being part of the school culture and helping out if and when needed. The researcher assisted in the music sessions, school outings, school social events e.g. end-term parties for the parents and school staff, and internal and external music projects with these students.

One of the researcher's roles after visiting the fieldwork site was taking care to establish a good rapport with the participants and school staff. This was facilitated by accommodating to the routines of the school timetable, establishing what the researcher

had in common with the school staff, displaying an interest in what the children were doing, and trying to fit into the environment while retaining her own identity (Mertens, 2005).

Another important role for the researcher was to enter the field in the least disruptive manner possible to preserve its authenticity. The researcher did not pose herself as an 'expert' in the children's lives but as someone who was interested in learning about their lives and musical behaviours. This included sharing information about herself and feelings with the children and the school staff. It was important to respect every child whom the researcher encountered while building a trusting relationship with them. Awareness of the timetable and personnel changes in the school was also important, because this could strongly have affected the children's behaviours and learning process in the music lessons.

Coming as an outsider, the researcher needed to explain to the children, and school staff, the reasons for being there. The overall research purposes were explained to the children and school staff and a written research proposal was provided for the school management team. The role of an 'non-teaching' adult fitted well in the school setting as the concept of an adult helper was familiar within the school culture. The researcher was viewed comfortably as a helper and the children would come near, talk and stay, play ball games or simply want to gain the researcher's attention for what they were doing. The children decided which role to adopt with the researcher's presence in the music lessons and in the school.

The researcher did not belong to any group in the school. This had both advantages and disadvantages to study the musical development of these children. On the one hand, the researcher could have taken a relatively neutral role in observing the school culture and

system, music provision and the children's musical experiences and behaviours. The disadvantages were that, while complying with the ethical codes of research practice and building mutual relationships of trust with the children and staff, it was still very difficult to have access to certain sensitive documentation pertaining to the children. It was also not easy to obtain some parental consent for their children to participate in the research.

The researcher's role shifted between being a quasi-teaching assistant (TA) and a more distant observer. The quasi-TA's role involved demonstrating musical instructions and playing the piano accompaniment in the children's musical performances in the class, talking to the children, pushing their wheelchairs around the school and to the nearby musical hall (being a facilitator in the children's small group practices and formal musical concerts) and playing sports with the children in extra curricular activities. The role of a more distant observer included writing down processes and events which happened inside and outside the music lessons.

5.5 Selection of the fieldwork site and cases

The empirical fieldwork started with two pilot visits to a special school in West Sussex and conversations with two music teachers working with children who had complex needs. After these two pilot visits, the researcher decided to enter a designated fieldwork site which was a special school in Inner London with which the researcher's main supervisor already had an established link through another research project. After gaining entry permission and initial consents, the fieldwork was carried out for 13 months.

During the fieldwork, formal interviews and informal discussions were conducted with the headteacher, music teacher, classroom teachers, teaching assistants and parents in order to talk about their views and beliefs concerning the place and value of music for children with complex needs, both within the context of the school music culture and also their family practices. During this research period, several students were selected, with the appropriate ethical approvals, as the case studies.

5.5.1 Selection of the fieldwork site

The research site was viewed as a single entity which may represent certain levels of commonality with other special schools in the UK, and had its unique characteristics in geography and culture for music practices. Criteria for finding and choosing the fieldwork site were based on the need for:

- recommendation by staff from the Institute of Education who had previously observed the music teacher's work;
- good teaching performances with children who have complex needs as listed in the school's Ofsted inspection report;
- at least one music teacher who had worked with the children for more than a year;
- the children's ages ranged across primary and secondary departments;
- open to, and would welcome, the researcher's observation during November 2006 and on over at least six months (in the event, the research fieldwork lasted through to December 2007).

Entry permission

There are appropriate procedures to gain permission to enter the field (Mertens, 2005). In this research, the first step required was to make contact with the school headteacher, administrator and the music teacher, either in person, on the telephone, e-mail or via

official letter. The researcher needed to obtain the necessary agreement from the special school to gain access to the fieldwork site.

Negotiating consent occurred at different stages in the research process, when certain assurances needed to be made. Adherence to the special school's review process and policy in terms of protection of the children and any possible identification of costs to the school (Mertens, 2005) was followed and taken into account. The official consent form for video recording was designed in consultation with the management team, school staff, and handed to relevant parties for their approval, e.g. primary and secondary department directors, before being handed out to the parents.

Researchers (Fetterman, 1989; Mertens, 2005) acknowledged that ethnographic fieldwork usually requires long periods of time from six months to two years or more in the field and emphasises the significance of detailed observational evidence. When visited the fieldwork site, the researcher was expected to have an open mind and to try to absorb what may happen in the research field whilst having preliminary thoughts about research design, specific data collection techniques and the conceptual frameworks from the literature review. At the same time, the researcher was also aware that she may have had begun with biases and preconceived notions about how children with complex needs behave, and to interpret what they think in what she saw.

As the researcher approached the field site from an outsider's perspective (Mertens, 2005), this ethnographic fieldwork included exploring aspects of existing educational systems, mapping the demographic characters of the students and investigating the available music provision in the special school.

After visiting the site for a certain amount of time, the researcher also needed to consider when to finish the observation. According to research texts (e.g. Fetterman, 1989), the main principle in making the decision of when to leave the site is to avoid premature closure, which will likely cause inaccurate conclusions based on insufficient observations. In this research, the time to leave the field was when the researcher felt that she had collected enough data to describe the children's musical behaviours and development and to say something significant about it. Fetterman (1989) wrote that 'the ethnographer needs to gather sufficient and sufficiently accurate data to feel confident about research findings and to convince others of their accuracy' (p. 20). In this research, the time to leave the field was also affected by special circumstances, regarding staffing. Overall, the fieldwork observation was conducted over an extended period of time from November 2006 to December 2007 at weekly intervals in school terms, with one to two days a week from 9.30 am to 4.30 pm. The fieldwork observations took a total of 13 months.

5.5.2 Selection of the cases

Initial visits that were made in the first two weeks were regarded as part of an initial exploratory period for the researcher to familiarise herself with the environment and the school culture. These also served as an opportunity to begin to know the children and to make an initial decision on the possible participants for case studies. For each visit, the researcher stayed in the school and observed the children's whole day school activities, including their music lessons. The primary aim was to saturate herself in the environment. After consultation with the music teacher, the researcher created several selection criteria to choose likely representative cases of those who had complex needs in this special school. The criteria for choosing the children were that they should have diverse ages, different physical and communicational abilities, of both sexes, different ethnicity, and reportedly different musical abilities.

In summary, the criteria for the selection of participants for multiple case studies were as follows:

- school and parental consent for participating in the research;
- history of regular school attendance;
- complex needs of either SLD and PMLD;
- a wide age range from four to 19 years old;
- different level of response towards music as reported by the music teacher;
- boys and girls;
- would likely to be available during the proposed research period.

As initial background information, there were three cases chosen for this research. They aged from 11 to 18 years old. One of them was female (case K) and the other two were male (cases J and H). Two of them had SLD (cases J and H) and the other had PMLD (case K). Two of them were in the same music class (cases K and H), and all three cases (cases J, K and H) were taught by the same music teacher. More detail information will be provided in Chapters 8 to 10 and section 11.2.

5.6 Data collection

The data collection was mainly conducted through qualitative research in ethnographic fieldwork and case study research. In any observation of human behaviours and interaction, multiple realities are present and the researcher needed to take into account different perspectives. Using Mertens' (2005) concept of the 'collaborative construction of text' (p. 248), documents, conversations, video and audio recordings and interview data were gathered to construct the relationship between music and children with complex needs. The researcher worked to put the different evidence together to form a

picture of the possible musical experiences and development that these children and young people had.

In this study, the researcher was functioning as the instrument for collecting unstructured data (Flick, 2006). The collected data included field observational notes, audio and video recordings, conversations and interviews and school documentation. The main sources of data in this research, with some further descriptions in the following paragraphs, were:

(i) Ethnographic fieldwork for the background information of the three cases. It contained the music provisions within and outside the special school (e.g. special music project) and is recorded in field notes. It also included photographs taken of the school environment and observations of the students in lunchtime break (see Chapter 7);

(ii) Direct and longitudinal case observations of weekly music teaching situations on audio or video recordings for the three case studies in this research (see Chapters 8, 9 and 10);

(iii) Formal and informal interviews with the headteacher, music teacher, class teachers, teaching assistants, bus drivers and parents, captured as digital files;

(iv) Official school documentation in hardcopy and from the school website.

5.6.1 Fieldwork notes and video/audio recordings

After obtaining the school and parental consent to conduct the research with the case-study focus students, an audio minidisk recorder (from week 3) and video camcorder (from week 16) were used to record each music session on a weekly basis. The audio data was collected after gaining permission from the school and the music teacher, whereas video data could only be obtained until week 16, after receiving the

consent from the parents. They were to capture empirical data and help to provide reliability and validity for the description and interpretation of the research findings. Fieldwork observations not only involved weekly music lessons, but also other curriculum settings. The school staff also offered their help in the study, providing further suggestions, clarification and confirmation during the fieldwork observations.

Keeping field notes is an important process in ethnographic fieldwork and case study. Fetterman (1989) wrote that 'the most important element of fieldwork is being there – to observe, to ask seemingly stupid yet insightful questions, and to write down what is seen and heard' (p. 19). Robson (2002) also emphasised that keeping a full and complete record of all the various activities involved in the research project was good practice. The content of field notes, as Silverman (2005) noted should include what the researcher can see and hear and how the researcher is behaving and being treated. It should also emphasise in documentation as to how the children were behaving and being treated in the school and in music lessons. The field notes were very valuable as they helped the researcher to produce reflexive thinking during the process of the research. As Fetterman (1989) said, ethnographic data being organised and accessible is enormously helpful, especially when the researcher leaves the field and 'tries to put the entire puzzle together' (p. 19). The habit of keeping the research notes sheds light on the data analyses and discussion in the later stages of the research process.

5.6.2 Participant-observation

As described above regarding the researcher's initial role as a quasi-teaching assistant, the researcher used participant-observation as a way to collect data. Yin (2003) noted that 'participant-observation technique has been most frequently used in anthropological studies of different cultural or social groups' (p. 94). The researcher was not merely a passive observer. Instead, she assumed a variety of roles within music lessons and

participated in the musical events being studied and, at times, served as a staff member in the special school.

The strengths for participant-observations as a source of data collection are that they cover events in real time, reveal reality, and cover context of event. It also provides insight into interpersonal behaviours and motives. The weaknesses of this method are that it is time-consuming and selective unless with broad coverage. It has reflexivity which means that an event may proceed differently because it is being observed. In this case, the children with complex needs may not behave differently, but the school staff may. The participant role may simply require too much attention relative to the observer role and the participant-observer may not have sufficient time to take notes or to raise questions about events from different perspectives.

For the multiple case studies, direct participant-observation was part of the main methods for collecting data. The observations ranged from formal to casual data collection activities. The observational protocols were developed as part of the case study protocol through using the *SoI* framework and the assessment procedure (see Chapter 6) to assess the incidences and levels of musical behaviours of these children during the fieldwork span. Direct participant-observations were made throughout fieldwork visits including those occasions during which other evidences were being collected. The researcher also took photographs at the fieldwork site, which was regarded as valuable in helping to convey important characteristics of the special school to readers.

5.6.3 Interviews

Guided conversations and open-ended interviews were conducted with school staff and parents, formally and informally. Due to the fact that most of the children and young

people were non-verbal and had communication difficulties, the researcher interviewed those who were closest to them. School staff and parents were asked about their experiences in working and living with these children and the children's responses towards music and sounds. The interviewees were given sufficient time and space to talk and reflect upon their experiences and observations when being with these children. The interview questions used a semi-structured framework based on examples of the previously observed children's behaviours inside and outside of the music lessons. For the set of interview questions which derived from the case study protocol, see Appendix C.

The interview questions had two purposes. One was to follow the researcher's line of inquiry as reflected by the case study protocol. The other was to ask conversational questions in an unbiased manner to serve the research inquiry. The duration of each interview varied from 15 minutes to one hour and, in most cases, each was recorded on a minidisk. The formal interviews with the key school staff were conducted near to the end of the fieldwork. All the interviewees had more than two years working experience with the participants. There were in total 24 interviews.

The strengths of using the interviews as one of the sources of data were that they were targeted and focused directly on the topic. The weaknesses of this method were that they may have introduced biases due to poorly constructed questions, response bias, poor recall, the inaccurate articulation, and reflexivity that the interviewee gives what the interviewer wants to hear. A few interviews were not audio recorded due to the interviewees feeling uncomfortable or being refused permission. In these situations, the researcher wrote down notes throughout the interview process.

5.6.4 Documentation

School documentation was collected during the period of fieldwork observations. General sources of information were from school's prospectuses, school's website, other written reports of events, announcements, participants' Individual Learning Plans and annual report, and their annual music report and assessment scores.

The strengths of using documentary evidence were that they were stable and could be reviewed repeatedly. Documentary evidence also had broad coverage over a long span of time – and many events. The weaknesses of the documentary evidence were that if collection was incomplete, the retrievability could be low, with biased selectivity and reporting. Furthermore, the access to certain documentation may be deliberately blocked as noted above.

5.7 Data analyses

A systematic approach is required for analyses of any kind of data, including qualitative research (Delamont, 1992; Neuman, 2006). This study went through a process of repeated analyses of the empirical data from the various data collection strands (see Chapter 6).

5.7.1 The school's contextual background analyses

The fieldwork in studying the special school's music provision (see Chapter 7) followed through systematic analyses of ethnographic narrative accounts (Berg, 2007). While trying to preserve the rich textual detail of the data, Berg (2007) specified this approach as follows:

1. Develop a number of constructs by sorting the categories of the various chunks of data. Many of these categories were from reading the literature, e.g. gender of

children with SEN and music provision in the special schools. Data were being analysed including segments of text from field notes, interview transcripts and school documentation.

2. Open coding: initial reading the collected data such as field notes to produce contextual background accounts. This process was to reinforce themes developed during the data-collection phase and to generate new themes previously unrealised. It also allowed the researcher to identify themes in a systematic manner, e.g. musical preference and motivation.
3. Axial coding: this is the process of relating codes (categories and themes) to each other in order to understand the relationships between wider context conditions and the phenomenon that are being studied. The researcher recorded certain patterns covering conversations with school staff and parents regarding the music provision/musical activities which the children had experienced both inside and outside their special school.
4. Ethnographic narrative accounts: ethnographic fieldwork is viewed as both the means and the product for the understanding of the contextual background for the case studies.
5. It relies on lengthy textual accounts to document themes and patterns observed in the data. The researcher presented lengthy narrative textual accounts from the gathered data to produce a detailed description.

5.7.2 Multiple case studies analyses

For high quality analyses, Yin (2003) noted that the analyses should show that the researcher attends to all the evidence and that analytic strategies must be exhaustive. Besides, the analyses should address significant aspects of the case study. Lastly, the researcher should also use her own prior expert knowledge in the case study.

When conducting case studies, Berg (2007) noted that 'quantitative and/or qualitative studies of one research entity at multiple time points' (p. 293) are regarded as longitudinal case studies. Similarly Neuman (2006) defined longitudinal research as 'any research that examines information from many units or cases across more than one point in time' (p. 37). As this research examines and investigates the three cases across more than one point in time, and has regular weekly data entries over 13 months, it can therefore be considered longitudinal multiple case studies.

In this research, the process of data collection, organisation and analyses for case studies is carried out in a systematic way. Chapter 6 provides detailed description of this systematic procedure. The design of multiple case studies is based on theoretical orientation of the *SoI* framework, case study approach and a newly developed assessment procedure (see Chapter 6) to record and analyse the empirical data. These, in turn, reflect the research questions and review of the literature. This new assessment procedure guides the case study analyses and helps to organise the entire case study research. The case study approach and the new assessment procedure are used to develop a descriptive framework for organising the data analyses. It attempts to describe systematically the change of musical behaviours of the students over a period of 13 months.

Data analyses for the cases are made from the audio and video recordings of each music class and research field notes. The specific analytical techniques for analysing multiple case studies are profile pattern analyses, time series analyses and (in latter research stage) cross-case synthesis. These techniques are used along with the general strategy under the methodological, theoretical (see Chapter 4) and operational (see Chapter 6) frameworks.

For time series analyses, larger data input is gathered and further profile pattern analyses are used to analyse the data. A major strength of case studies over time is that the researcher is able to trace possible changes longitudinally and is not limited to cross-sectional or static assessments of a particular situation. The events of children's musical behaviours over a period of 13 months are traced in detail so that time series analyses are applicable (see Chapter 6).

When documenting the illustrative moments of musical engagement that were observed in the music lessons, the researcher uses certain abbreviations and a notation system to represent the school staff, participants, and their singing activities. For example, T is for the music teacher, TAs is for the teaching assistants and different children are given a capital letter to substitute their real names (which is in line with the ethical requirements). A notation system (based on a Chinese music notation) is also adopted to notate for the singing activities. The numbers are given to represent the teacher or a child's singing voices in order to distinguish from their speaking voices. In the sequence of a Western major scale such as Do, Re, Mi, Fa, Sol, La, Ti, Do the representative numbers are 1 2 3 4 5 6 7 i . 1 is Middle C and a little dot under a number means the note is below Middle C, such as $\dot{1}$ is to be used an octave lower. A little dot above a number means the note is above Middle C, such as i is to be used an octave higher. Each number represents a crotchet such as 1 = ♩, a underline represents a quaver such as $\underline{1}$ = ♪, two underlines represent two semiquavers such as $\underline{\underline{1}}$ = ♬, and a short line after a number represents minim 1 − = 𝅗𝅥. For sharps and flats, it uses ♯ and ♭ besides a numerical number to indicate the change of a note.

5.8 Codes of ethics and ethical issues

This research complied with the ethical expectations from the special school and the codes of ethics of the British Educational Research Association's (BERA) Ethical Guidelines (2004). A policy of 'voluntary informed consent' was followed to obtain consent from the school and parents for their children to participate in the study. Assurances were made to the school and participants that all the research data that was gathered (essentially observational data, supported by audio and video recordings for detailed analyses) would be treated as confidential. No participant would be identified by names in any written text arising from the data collection in line with the guidance of consent and anonymity. Silverman (2005) wrote that 'consent was sought on the understanding that the anonymity of all [participants] would be strictly protected by concealing their names (and other identifying information) in reports or publications' (p. 261). Each participant also had the formal right to withdraw from the research at any time.

One of the ethical issues arising from this study was who could speak for another. It was not possible to interview the participants in the study because most of them were non-verbal or in the very early stages of language and cognitive development with limited comprehension. Moreover, the children and young people in this study had severe or profound disabilities and the researcher did not share these disabilities. Therefore, the researcher explained to the students why she was in the school and asked their permission to participate in this study with very simple language. It was not clear how much the students understood but they would either smile, vocalise or have direct eye contact with the researcher. Then the researcher took these responses as 'yes'. The researcher also needed to be aware of her own values, assumptions, beliefs, and biases and monitor these throughout the study in order to minimise the impact of her

interpretations on the data.

5.9 Reliability and validity

Reliability and validity are important criteria to judge the quality of a research design. The researcher needs to consider the internal and external validity and authenticity in this study (Mertens, 2005). There are three principles of data collection that this research followed in order to establish the construction of validity and reliability of the case study evidence. These three principles were 'intended to make the process as explicit as possible, so that the final results...reflect a concern for construct validity and for reliability, thereby becoming worthy of further analysis' (Yin, 2003, p. 106). Here are the principles:

1. Use multiple sources of evidence;
2. Create a case study database;
3. Maintain a chain of evidence.

The use of multiple sources of evidence was to encourage convergent lines of inquiry. The rationale of using multiple sources of evidence was for triangulation. If it was based on several different sources of information with investigated corroboration, then the findings or conclusion in case studies were likely to be more convincing and accurate. When a researcher had triangulated the data, the events or facts of the case studies have been supported by more than a single source of evidence.

For the internal validity, it was the result of prolonged and substantial engagement with the school staff and the students. Weekly observations were conducted over a year to identify emerging issues within the specific contexts. A process of triangulation was

carried out by checking information that had been collected from different sources, for example, through field notes/fieldwork observations, school documentation, audio and video recordings and talks/interviews. Methods to test consistency of evidence were conducted using video and audio recordings and a unified music observational protocol (see Table 6.1) and assessment procedure (see Chapter 6) across different case studies. For the ethnographic fieldwork and case study, the researcher conducted intensive fieldwork and described in detail the contextual background and the participants' musical behaviours and development over a period of 13 months.

A large number of observed moments of musical engagement in the case studies were considered to strengthen the validity of this study. The detailed descriptions of the case studies, which included exhaustive observational data and rating numbers, were abundant. In addition, a detailed description of the empirical data was also listed in Appendix I to L and in three case study chapters for the readers and other investigators to make judgment and to examine the researcher's analyses.

The meaningful organisation of data into carefully coded databases is essential in this research. The research method texts suggested that case study notes and field notes were likely to be the most common component of a database. These notes were a result of the researcher's informal talks, formal interviews and observation. Storing the case study data needed to be in a manner which is organised, categorised, completed and could enable the researcher or other investigators to retrieve them efficiently for later access.

The database also included open-ended answers to the questions in the case study protocol. This was to make the connection between specific pieces of evidence and various issues in the case studies through using the footnotes and citations. The case study database contained not only the reports, but also video and audio recordings,

school documentation and interview recordings/transcription for other investigators to review the evidence under the ethical guidelines. In this way, the case study database increased the reliability of the entire multiple case studies.

Maintaining a chain of evidence was to increase the reliability of the information in a case study. This principle was to allow the reader to follow the derivation of the gathered evidence from initial research questions to case study conclusions. In other words, the reader should be able to trace the steps from research questions to conclusions and in the reverse direction. When considering reliability, the researcher needed to demonstrate the operations of the study for other investigators to do the same case over again, so that the original premises and findings could be tested in the future (Berg, 2007). One way of dealing with this was to document the research procedures of the case studies and develop a case study protocol.

In order to meet the objective, Yin (2003) proposed four strategies. Firstly, sufficient citation to the relevant portions of the case study database should be made in the report. Secondly, the database should indicate the circumstances of data collection and reveal the actual evidence. Thirdly, data collection should follow the research procedures and questions stipulated by the protocol consistently. Fourthly, a case study protocol should indicate the link between the content of the protocol and the initial study questions. The *SoI* theoretical framework and the newly developed assessment procedure served these purposes in this research.

In considering authenticity, it is important for the researcher to present a balanced view of all perspectives (Mertens, 2005). In order to reduce potential researcher bias, a draft of the school's background report was submitted to critical management team in the special school to review and confirm the findings and offer member checking (Robson,

2002, p. 175).

In addition, extracts of the audio and video evidence were also discussed in detail on several occasions with the core members of the *SoI* research team in order to ensure that the *SoI* categorisation judgements and ratings were both valid and reliable. Communication and confirmation from the school staff and the *SoI* team members also helped the researcher to gain more reliability and triangulation in this area of study.

5.10 Summary

This chapter illustrated the overall research questions and rationale, and the research strategies adopted for the three case studies.

This research is the first longitudinal descriptive study which aims to map, to understand and to provide directly observed data on children and young people's musical behaviours and development over time in a special school. There are three case studies which are carried out through direct observations over a period of 13 months, therefore filling the research gap within the currently under-researched literature.

The main research strategies integrated in this study include the *SoI* theoretical framework (see Chapter 4), the creation of a new assessment procedure (see Chapter 6) as an operational tool to assess and analyse the musical behaviours of children and young people with complex needs, and the case study approach as the overall methodological framework. The ethnographic fieldwork, serving as an embedded part of the case study methodological framework, helps to provide the contextual background information for the special school where these students are situated.

A systematic set of research processes were followed when gaining access to the fieldwork site, obtaining consent, making fieldwork observations and taking field notes, obtaining school documentation, conducting formal and informal conversations and interviews with school staff and parents, taking photographs and audio/video recordings, and building mutual relationships of trust with school staff, parents and the children and young people with complex needs.

Ethical issues were made explicit and addressed through the acquired consent forms from the school management team and parents. A code of ethics guidelines was also being followed and assured to the school staff and participants. Internal and external validity, reliability and authenticity were addressed and discussed in the study to ensure and examine the quality of the research process and outcomes.

Chapter 6

Assessment procedure

6.1 Introduction

When conducting case studies, it is important to follow systematic procedures to limit equivocal evidence or biased views that may influence the direction of the findings and conclusions.

Ockelford (2008) proposed a version of *SoI* assessment rating scheme. In total, there were three domains; each domain had six levels; each level had four elements (these were from the original *SoI* theoretical framework); each element had three factors; each factor had five definitions, and plus five levels of consistency (see Appendix D for an example). If we multiply them as 3 x 6 x 4 x 3 x 5 x 5, there were 5,400 suggested assessment rating possibilities for the students' musical behaviours (Ockelford, 2008, p. 96-110; 265-284).

Through some modification and simplification, Ockelford (2009) proposed another version of *SoI* assessment rating scheme, with the original three domains, six levels, and four elements, but this time only added five levels of engagement and another five levels of consistency. Even with this version, there were still 1,800 rating possibilities for the students' musical behaviours, which was rather complicated.

Such complexity makes it rather difficult to operate in practice. Therefore, there is a need to generate a new assessment procedure based on, and further developed from, the original *SoI* framework in Chapter 4. This new procedure will hopefully enable the *SoI*

theoretical framework to be used more easily in a practical way.

As one of the original contributions to this research, the researcher designs a new assessment procedure to function as the operational framework in this study. Except for steps 3, 4 and 8, which adopted part of the *SoI* framework as the theoretical foundation, the remaining steps of the assessment procedure are designed by the researcher (see section 6.2). It is a specific research tool for data collection, organisation and analyses, and it will hopefully enable the researcher to carry out the multiple case studies in this research.

6.2 The assessment procedure

The new assessment procedure follows a systematic approach. It codes the collected data using three domains, six levels and four elements from the current *SoI* framework, combined with the researcher's original design of six colour levels of 'concentration' (which depends on the relative frequency of occurrence of musical engagement moments at each level). This assessment procedure can be summarised as follows (see Fig. 6.1):

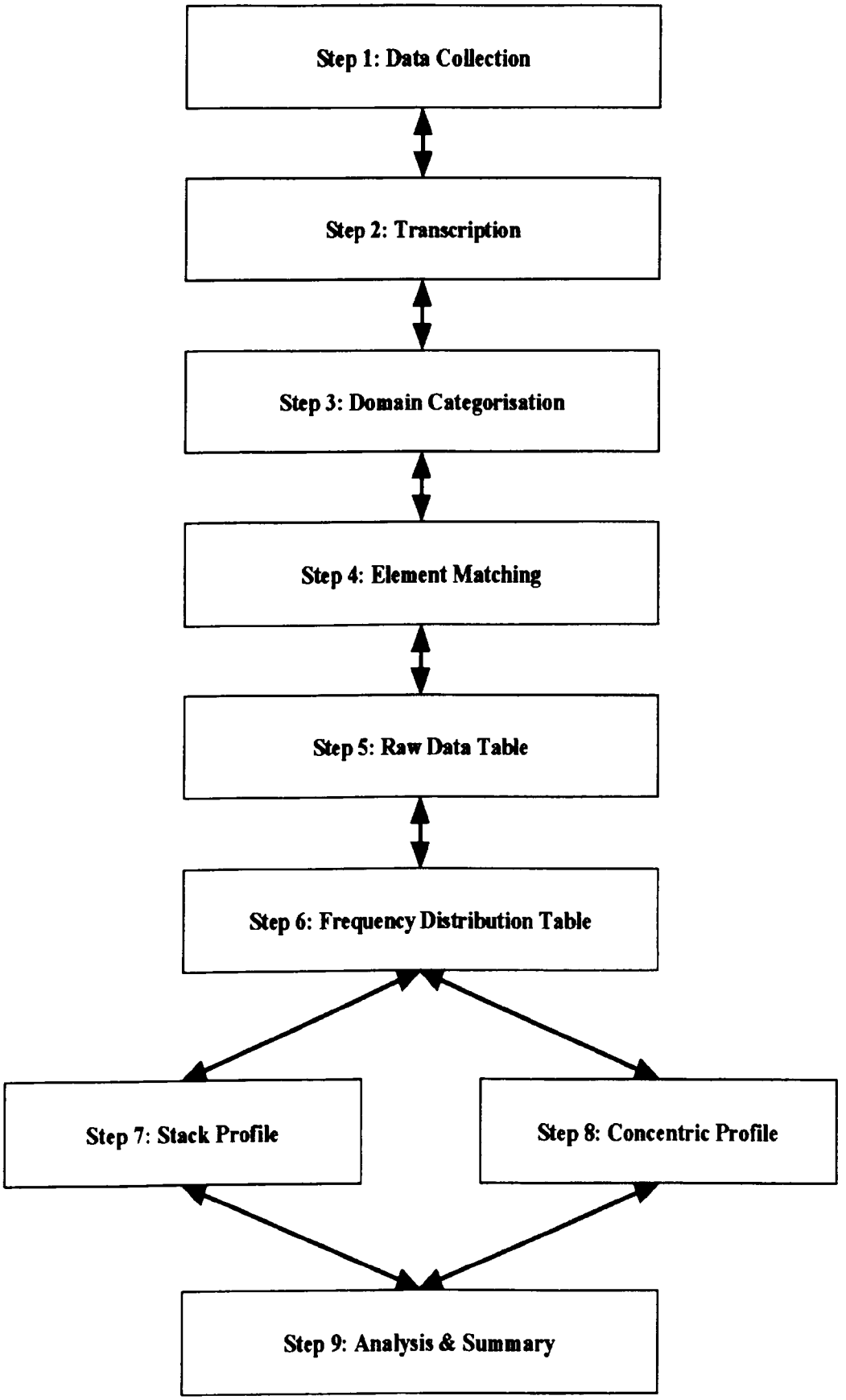


Fig. 6.1 Organisational chart of assessment procedure

6.2.1 Steps 1 and 2: Data collection and transcription

After gathering the empirical data, each week's audio or video recordings are initially transcribed by using a specially designed table that makes explicit the time related actions (including talk) and responses of the music teacher, children and their teaching assistants. Table 6.1 shows the time-related action-framework which is adopted for the transcription of activities and actions across the course of an individual music lesson. The transcription begins with an initial draft to code what is happening in the audio or video data into textual form along with the time coding. The initial transcription is broken into small events. Each event usually occupies only a very short span of time and sometimes it is only seconds in length, depending on the musical engagement moment. The researcher reads through these texts and marks moments of musical engagement for analyses. Further detailed transcription with comment and in depth analyses are also conducted according to the marks. This is an iterative and interactive process starting from the surface and then 'drilling down' into detail.

The systematic criteria for selecting and sorting data chunks for assessment are based on the moments of musical engagement between the teacher, the participants and their peers, and whether it is the teacher who tries to engage with the participants musically or the participants who initiate the musical engagement, along with the teacher's approach and peer activity. After the initial assessment, the researcher has to revisit marked moments of musical engagement in the video and audio data to obtain a more detailed transcription and further information relating to these marks. The researcher also needs to give analytical comments based on the *SoI* framework to assess the participants' responses while referring back to the audio and video recordings. Each moment of musical engagement is given a number for identification. This is a cyclical process between transcriptions, marks and raw observational (audio or video) data. This step provides detailed textual description of weekly video and audio recordings and

observational reports/field notes.

This whole process can be summarised in a table which contains the time, the relevant teacher and children's activity and the researcher's comment on the moments of the children's musical engagement. Table 6.1 is a short extract from the research worksheet as an example. In this example, the music teacher began the music lesson by singing a 'hello' song while shaking each child's hand. During the interactive 'hello' song, the students had the opportunity to respond and interact with the teacher or with each other. The song had been used to start the music class in this group for more than two years. The extract shows case J's responses in singing the 'hello' song individually in week 3. The transcription and marking process involves columns A, B, C, D and F in Table 6.1. Column A is the indicator for moments of musical engagement; column B is the timeline; column C is the teacher and TAs' activity; column D is J's activity and the researcher's comments; and column F is other children's activity. Finally, column E is for the *SoI* code, which will be covered in the following steps (steps 3 and 4).

Table 6.1 Transcription example from the case study of J in week 3
(A): indicator for moments of musical engagement; (E): *Sounds of Intent* code; (F): Other children's activity

(A)	Time (B)	Teacher and TAs' activity (C)	Child J's activity and the researcher's comments (D)	(E)	(F)
1	0.3 - 1.05	T: 'J, are you ready to do some good work for me?' J: 'Yah!' (A loud and clear voice). TA: 'he is very vocal today, yes'. T sings: '5 5 6 6 5 5 3 | Shake my hand and sing hello, 4 4 2 5 5 3 | sing hello, sing hello, 5 5 6 6 5 5 3 | shake my hand and sing hello, 2 2 5 5 1- | tell us what's your name? 2 5 5 My name is… ' J sings: '3 1 J'. T: 'oh, well done! 2 2 5 5 1- || Nice to know your name. Well done! J'	J vocalised alongside with the teacher's singing and sang 'hello' with the teacher once. He could sing his name clearly and appropriately within the structure of the musical phrase in the hello song. It seemed that he knew the musical sequence and understood when he needed to respond in the song.	R4A, P4A, I4B	

6.2.2 Steps 3 and 4: Domain categorisation and element matching

Steps 3 and 4 involve noting down the results from domain categorisation and element matching, and putting them into column E in Table 6.1. The time-related moments of musical engagement of each lesson allow the focus of the participants' musical behaviours to be coded. The next step is to sort these moments of musical engagement into related categorisations under three headings, namely as either 'reactive', 'proactive' or 'interactive' in character, which are adopted from the *SoI* theoretical framework. Each moment of musical engagement is treated as a unit for coding. The 'reactive' musical engagement embraces the ways that children respond when experiencing musical stimuli. The 'proactive' musical engagement implies that children create, cause or control music and musical sounds without necessarily responding to a previous stimulus. The 'interactive' musical engagement happens in the context of potential or actual musical communication between adult and children, or between children

(Ockelford, 2008).

The categorisation procedure entails allocating the moments of musical engagement to relevant domains. Due to the nature of fieldwork observations, each moment of musical engagement might be located in more than one domain. For example, one moment of musical engagement might be categorised into three domains (see Table 6.1). The judgment is based on the nature of the context, the teacher's activity and comments and the children's responses noted through the researcher's observation, field notes and video or audio recordings. Thus the detailed coding and documentation on all moments of musical engagement in each music lesson can potentially provide a complete picture.

Once the domain categorisation is completed, the next step is to match these moments of musical engagement with one of the elements and levels in that domain. Each of the three categories embraces six levels of increasing complexity which have been designed to indicate categorical differences in developmental attainment based on the second version of the *SoI* framework (see Fig. 4.3). Levels one to six are given a numerical coding from 1 to 6. Within each level, there are four sub-elements (A, B, C and D) to illustrate different example musical behaviours for each level (see Fig. 4.4).

Based on the domain and element chart of the *SoI* framework (see Figs. 4.3 and 4.4), the researcher considers $3 \times 6 \times 4 = 72$ possibilities when assigning each moment of musical engagement. The researcher also decides that, when assigning each musical engagement to the appropriate *SoI* level and element, the choice will be only one level and one element that are 'best matched' in terms of prominent features in each moment of musical engagement. The main reason for adopting the best element and level matching approach is that the three domains are more loosely connected, whereas the six levels of musical development show a more obvious hierarchical structure. Adopting

the best level matching approach also makes it more operational when carrying out the production of a raw data table (see Table 6.2), frequency distribution table (see Table 6.4) and the musical development profiles (see Figs. 6.2 and 6.3) in later steps.

As for the elements, they are mainly used for the *SoI* level identification in this empirical research, and therefore will be treated as working in a parallel manner. This means that when one of the best matched elements is chosen, even though there might be other relevant elements at the same level, for the *SoI* level identification purpose it will make no material difference.

6.2.3 Step 5: Raw data table

Once the domain categorisation and element matching are complete, the researcher can generate the raw data table to summarise the information in a more abstract form (see Table 6.2). In Table 6.2, the first column is the week in which the researcher observed the music session with audio or video recordings. The second column is the series of moments of musical engagement and is based on a straightforward timeline. This example is taken from the case study of J, so the researcher puts J in front of the observation number. Domain categorisation occupies the next three columns, which contains the reactive (R), proactive (P) and interactive (I) domains. For the observation J001, the reactive, proactive and interactive domains are all labelled as 1. This means the three domains of musical behaviours in the *SoI* framework all occurred in this event. As another example, J002 shows that this moment of musical engagement involves only musical behaviours from the reactive and interactive domains, but not from the proactive domain.

Next to the domain categorisation is the element matching part. It contains three subtitles from the reactive, proactive and interactive domains. For each domain, there

are two sub-columns which are labelled as 'level' and 'element'. The label 'level' refers to the levels in the *SoI* framework, which is from level 1 (simple music behaviours) to level 6 (complex music behaviours) where 6 is the highest level. The researcher allocates the appropriate level when considering the students' musical behaviours within each moment of musical engagement. In the element column, there are four elements associated with each level in each domain. The elements are labelled from A to D and they are parallel to each other without any hierarchical relationship (which is confirmed by the *SoI* framework research team). For example, in observation J001, the raw data in three domains is R4A, P4A and I4B, whereas in observation J002, the raw data is R3A and I2D.

After the researcher finishes domain categorisation and element matching, the raw data table for the case study is complete. Table 6.2 shows the raw data table for the case study of J in week 3 as an example. The individual ratings (being related to the vertical and horizontal locations identified in Fig. 4.4 as most closely corresponding to the observed behaviours for each level and element) can also be counted towards the total number of coded moments of musical engagement that have been noted across the lesson.

Table 6.2 An example from the case study of J's raw data table in week 3

		Domain Categorisation			Element Matching					
					R		P		I	
WK	OBS	R	P	I	Level	Element	Level	Element	Level	Element
03	J001	1	1	1	4	A	4	A	4	B
03	J002	1		1	3	A			2	D
03	J003	1		1	3	A			2	C
03	J004	1		1	3	A			3	A
03	J005	1	1	1	2	B	2	B	2	A
03	J006	1	1	1	3	C	3	A	3	C
03	J007	1	1	1	4	A	4	A	4	A
03	J008	1		1	3	D			3	C
03	J009	1	1		3	A	3	A		
03	J010	1	1	1	4	A	3	C	4	A

6.2.4 Step 6: Frequency distribution table

From the raw data table, the researcher then generates weekly frequency distribution tables for further processing. This table is the basis to produce the stack profile and concentric profile. The researcher looks into the raw data table, calculates the frequency of each level, and puts the figures into frequency columns with associated levels. The same procedure is repeated in three domains and this generates a frequency distribution table for each week.

Here is an example, taken from the weekly frequency distribution table (see Table 6.3) from the case study of J in week 3. From this table, we can see that there is only one occurrence for R2, six occurrences for R3 and three occurrences for R4. The total observations are 10 in the reactive domain. In the proactive domain, P2 has one occurrence, P3 has three occurrences and P4 has two occurrences. The total observations for the proactive domain are six. Finally, in the interactive domain, I2 has two occurrences, I3 has three occurrences and I4 has four occurrences. The total observations for the interactive domain are nine for week 3. This table provides an overview on the distribution of the musical behavioural occurrences at different levels

in the *SoI* framework. In this example, the reactive domain is more concentrated at R3 because most observations occurred within that level. In the proactive domain, the mode is at P3. In the reactive domain, the observations concentrated more on I4.

Table 6.3 An example of frequency distribution table from the case study of J in week 3

Weekly Frequency Distribution Table							
Phase	WK	R		P		I	
		Level	Freq	Level	Freq	Level	Freq
1	03	R1		P1		I1	
	03	R2	1	P2	1	I2	2
	03	R3	6	P3	3	I3	3
	03	R4	3	P4	2	I4	4
	03	R5		P5		I5	
	03	R6		P6		I6	
	03	Total	10	Total	6	Total	9

Based on the concept in Table 6.3, the researcher can generate two different versions of profiles. Steps 7 and 8 will explain how the profiles are produced and how they are used. However, in order to produce these two profiles, the distribution table (see Table 6.3), which is in absolute frequency form, needs to be further transformed into a relative frequency table (see Table 6.4). The relative frequency table shows the relative occurrences of musical behaviours from each level and domain within a week. The relative frequency not only covers the character of mode, where the largest percentage is, but also shows relative relationships between different levels and domains. To draw the relative frequency on observed musical behavioural occurrences, each occurrence is noted down and then transformed into percentage terms. Higher percentage scores represent the higher observed musical occurrence. The purpose of using relative frequency is for standardisation, so that comparison across different domains and different time frames can be made.

Table 6.4 An example of relative frequency distribution table from the case study of J in week 3

Weekly Relative Frequency Distribution Table									
Week	Domain	Freq	%	Domain	Freq	%	Domain	Freq	%
03	R1	0	0	P1	0	0	I1	0	0
03	R2	1	10	P2	1	17	I2	2	22
03	R3	6	60	P3	3	50	I3	3	33
03	R4	3	30	P4	2	33	I4	4	44
03	R5	0	0	P5	0	0	I5	0	0
03	R6	0	0	P6	0	0	I6	0	0
03	Total	10	100	Total	6	100	Total	9	100

6.2.5 Steps 7 and 8: Stack profile and concentric profile

From the weekly relative frequency distribution tables (see Table 6.4 as an example), the researcher can generate stack and concentric profiles to show the pattern of musical behaviours and levels of 'concentration' or relative frequency.

Based on the measurement from the relative frequency distribution table, the researcher categorises the relative frequency into six different levels of concentration and associates them with a graduated colour system. The percentage number in the relative frequency table from 1 to 20 is categorised as colour 1, from 21 to 40 as colour 2, from 41 to 60 as colour 3, from 61 to 80 as colour 4 and from 81 to 100 as colour 5. If the relative frequency is 0, then the category is colour 0 and the white colour will be filled in.

This concept can refer to different time frames, for example, weekly, monthly or different phases. The colours from 1 to 6 (light to dark) in the reactive, proactive and interactive domains are based on different palettes. This graduated colouring system is to show the distribution of relative occurrences and the levels of concentration of the students' musical behaviours. The darker the colour, the more the occurrences, which

means that the observations on the participant's musical behaviours concentrated on certain level(s) and thus shows the concentration.

The graduated colouring system, designed by the researcher, provides the readers with a rich visual representation of the case students' profiles at different periods of time. This kind of representation can act as an important and powerful device for teachers when communicating with the parents and other professionals and it can be represented in different time frames as well. Fig. 6.2 shows how the colouring system refers to the relative frequency in six different levels of concentration.

Colouring categorisation	0	1	2	3	4	5
Relative frequency (%)	0	1-20	21-40	41-60	61-80	81-100
Reactive colour palette						
Proactive colour palette						
Interactive colour palette						

Fig. 6.2 Relative frequency colouring system and palette

After designing this graduated colouring system, the researcher can then produce stack and concentric profiles.

For the concentric profiles, once the colouring system is completed, the researcher adopts the original *SoI* concentric "representational schemes" (Ockelford 2008, p. 81 and p. 96), and imposes the newly designed colouring system onto these representational schemes (see Fig. 4.3. in Chapter 4) to produce the concentric profiles.

Here is an example of the concentric profile from the case study of J in week 3. Fig. 6.3 uses the relative frequency to show the profile of concentration of J's musical behaviours which is based on the data from Table 6.4. It also demonstrates the use of

the colouring system in different domains in the concentric profile which is based on the palette from Fig. 6.2.

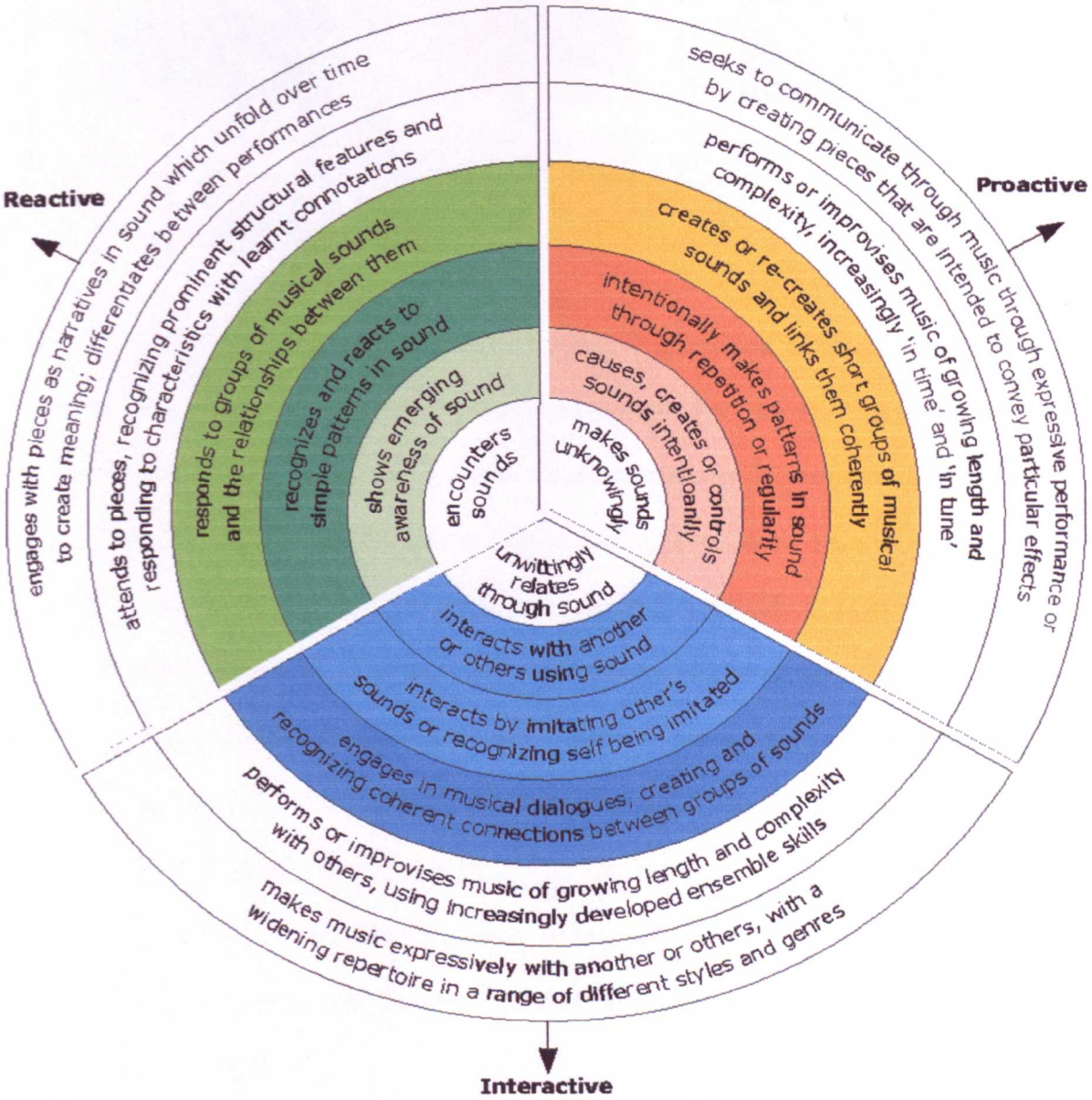


Fig. 6.3 The concentric profile of J in week 3

Fig. 6.4 shows an example of the stack profile of J in week 3. From these example profiles (Figs. 6.3 and 6.4), it shows a certain graphical pattern of J's musical behaviours. It concentrates mostly in R3, P3 and I4, and has musical behaviours ranging from level 2 to level 4 across the three domains.

Week 3 Profile of J					
Week 3					
Domain	%	Domain	%	Domain	%
R1	0	P1	0	I1	0
R2	10	P2	17	I2	22
R3	60	P3	50	I3	33
R4	30	P4	33	I4	44
R5	0	P5	0	I5	0
R6	0	P6	0	I6	0
	100		100		100

Fig. 6.4 The stack profile of J in week 3

The difference between stack and concentric profile is shown as different graphical representations of the case students' musical behaviours. For the stack profile, the usefulness of the device is principally for time series comparison. If there are more than two weeks' profiles, the researcher can put these weekly profiles in parallel manner, based on the reactive, proactive and interactive domains, respectively. It is much easier to see the changes between these weeks and to see relative colour movements week by week. In time series comparison, the stack profile seems better for comparison purposes than the concentric profile, especially when comparing multiple time points and generating a dynamic profile (see Fig. 6.5). In Fig. 6.5, there is a change of mode from R3 to R4 in the example. The range of musical behaviours also shifts from R2 – R4 to R3 – R5 in these three weeks. For the complete time series, see the case study of J (Fig. 8.4, 8.5 and 8.6 in Chapter 8).

WK		03	05	06
R	R1	0	0	0
	R2	10	6	0
	R3	60	18	9
	R4	30	76	64
	R5	0	0	27
	R6	0	0	0

Fig. 6.5 An example of weekly stack profile over time in the reactive domain from the case study of J

The concentric profile, on the other hand, reinforces a potential feeling of growth that expands from a limited sense of self into a wider environment of others and displays the information visually of 'evolving intentionality and agency' (Ockelford, 2008, p. 81). The concentric profiles in each week can also be used to produce a dynamic animation showing the changes in the students' musical behaviours through information technology (IT). For future research, an animated presentation of the profiles could become a more effective device for showing the evolution between different time frames through using a specially designed software that will automatically show the profile's dynamic change on the computer screen after the input from either researchers or teachers by touching the computer screen according to the students' musical behaviours occurrences and levels.

The stack and concentric profiles will be presented in the three case studies (see Chapters 8, 9 and 10) as the basis for the data analyses. When drawing these profiles, they are empirically-based perceptions of the musical behaviours of the students in the multiple case studies. This is due to the operational design in domain categorisation and 'best matched' principle in element matching, so that each moment of musical engagement is only assigned to one level and element in each domain. Although the *SoI* theoretical implication indicates that a higher level should cover all the lower levels, this research is mainly based on observed frequency. Therefore, the researcher only considers the best fit levels that are observed and uses these levels to draw the students' profiles. These two profiles can be used on different time frames, for example, weekly, monthly or different phases, depending on the research purpose.

6.2.6 Step 9: Analysis and summary

Once all the steps from 1 to 8 are complete, further analyses and analytical summary can be provided. In this step, data analyses are mainly based on the information

provided by the previous steps, including the raw data table (Step 5), frequency distribution table (Step 6) and stack and concentric profiles (Steps 7 and 8).

6.3 Summary

This chapter demonstrates how the current *SoI* theoretical framework can be further developed into a new assessment procedure. This new assessment procedure will function as the operational framework for the three case studies in this research.

The new assessment procedure not only provides a systematic way to record, transcribe and code the data, it also provides new analytical perspectives using frequency distribution tables and the resulting graphical profiles. Therefore, this new assessment procedure is considered as one of the main contributions of the whole research towards the knowledge of musical behaviours and development for children and young people with complex needs.

This procedure forms part of the case study protocol, and it is not purely in linear process. It involves going back and forth, working between the raw data in video or audio recordings, field notes, transcriptions and tables and figures that are produced in each step, so that detailed description of each case can be made. The new assessment procedure also uses a method of coding and converts qualitative events into numerical form, so that they may become conducive to further analyses in the case studies.

Based on the current *SoI* framework, which forms the theoretical foundation for part of steps 3, 4 and 8, the researcher have further designs a new assessment procedure. The resulting raw data table in step 5, the frequency distribution table in step 6 and stack and concentric profiles in steps 7 and 8 with gradual colour coding constitute the most

important original contributions to this new assessment procedure. By applying the concept of graduated colouring, two kinds of profiles (concentric and stack profiles) can be used to show the pattern of musical behaviours in three domains, and the possible dynamic change and movement over time.

Chapter 7

Contextual background of the case studies

7.1 Introduction

This chapter provides detailed contextual background of the musical and other-than-musical cultures, both within and outside the special school in which the three students are located.

As part of the overall case study research, it is important for the researcher to take into account the wider contexts in which the case students live and learn. These wider contexts may shape the children's daily experiences, which in turn influence their musical development.

The special school is viewed as a single research entity. Ethnographic fieldwork and participant-observation were utilised to collect the empirical data. Section 7.2 presents the key characteristics of the special school, the structure of the primary and secondary departments and a typical school timetable. Section 7.3 investigates the demographic background of the children in the school. Section 7.4 studies the children's musical experiences at home. Section 7.5 investigates the general music provisions in the school. Section 7.6 focuses on the music lesson in the school which involves the aims of the music teacher, music curriculum, teaching strategies and assessment. Section 7.7 presents the extra-curricular music projects.

7.2 The fieldwork site: a special school

The fieldwork site was a maintained special school for children and young people with physical and other multiple disabilities. It was situated in Central London. The school building was all on one level, except for the staff room. It was purpose-built in 1972 with easy access for wheelchairs in the corridors and through doorways. There were handrails along the walls for the children who need extra support when walking. An overarching school policy was to view each child as a unique individual with particular needs, supported within the school community. The school staff were expected to work together to empower the child with dignity and self-reliance (School Prospectus 2005/2006, p. 5).

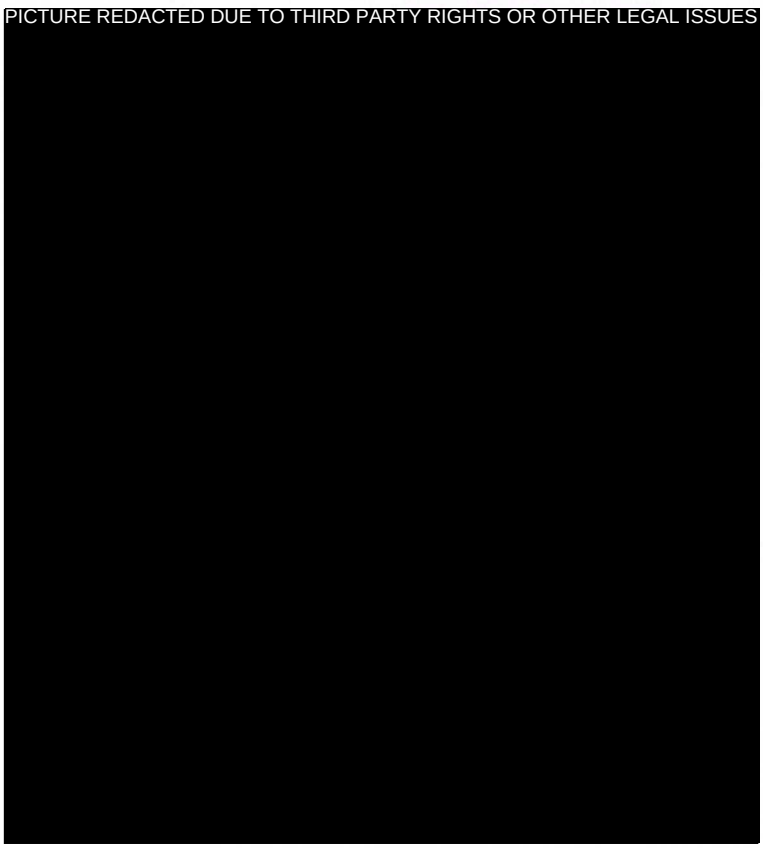


Fig. 7.1 The school's main corridor

Table 7.1 provides the summary of the characteristics of the school:

Table 7.1 Key characteristics of the school

Date of data collection	2007
Age	From age 4 to 20 years on roll.
Nature of the children's special educational needs	All children had physical disabilities and the majority of the children also had speech and language difficulties. About two-thirds of children had SLD or PMLD and a few had additional hearing or visual impairment.
Number of children on roll	There were 65 children in the school.
Community link	The school had a strong emphasis on links with the community and access to integrated learning opportunities with mainstream schools and nurseries. The school was working on two major re-location projects in 2008.
Gender	There were 41 boys and 24 girls.
Socio-economic status	The school documentation stated that the children's backgrounds span the socio-economic spectrum.
Free school meals	46% of children were entitled to free school meals (30 children). The data collected from the school reflects the national picture in inner London, with nearly half of the children in the school are entitled to free school meals (House of Commons, 2006).
English as an additional language (EAL)	39 children had English as an additional language (60%). Compared with the Audit Commission's (2002) survey with parent-partnership officers in England and Wales, the result 66% is similar to the school.
Ethnicity	18 children (28%) were White British and 47 children were from other ethnic groups (72%).

There were four classes in the primary department, consisting of early years, lower primary, middle primary and upper primary. The four classes covered Early Years Foundation Stage through to Key Stage 2. Children were divided into classes by age. The teaching groups were of mixed ability. Each class had one main teacher and about six to seven children, with one to three teaching assistants. The secondary department was organised into five tutor groups according to the children's age and individual needs. Each class had one main teacher and about seven to eight children and young people, with three teaching assistants. Children were not required to enter for public examinations but, where appropriate, children may enter for Standard Assessment Tests (SATs) at the end of each Key Stage of the National Curriculum. The National Curriculum level that the children have achieved was formally reported to parents. Table

7.2 illustrates a typical school day:

Table 7.2 The school's timetable

Time	*Structure*
9.15 am	Children arrive. Secondary department children go into tutor groups for reading. Primary department children have assembly in the hall for 10 to 15 minutes story telling and closing with a hand signing prayer.
9.45 am	Lessons begin.
10.45am	Break time (secondary department only, with snacks and drinks for each child and young people for 10 to 15 minutes). The primary department has a more flexible break time and this varies from upper to lower primary which depends on the class teachers in each classroom.
12 noon	Lunchtime and extra-curricular activities. From 12.00 pm to 12.30 pm, primary department children are in the hall for listening to music and playing with their peers, and staff interact with children using sensory equipment. Occasionally, there will be some singing activities or watching videos. From 12.30 pm to 1.10 pm, the secondary department children and young people arrive in the hall to listen to music, play sports, occasionally watch videos, and engage in other individual activities, e.g. members of staff interact with individual children or children listen to story telling from a tape. If the weather is pleasant, children and young people can go out to the playground to play.
1.15 pm	Afternoon school begins
2.15 pm	10 to 15 minutes break time for secondary department only. Same as 10.45 am schedule.
3.30 pm	End of the school day

During the researcher's visits, the structure of the playtimes and lunchtime extracurricular activities was observed to be flexible. On most occasions, staff took out various sensory materials or set up a sensory environment for the children to explore. Inspection report in 2003 noted that 'a very good range of activities are offered every lunch time' (Ofsted Inspection Report of the school, 2003, p. 13) and the staff provided suitable games for skill, concentration and competition. In general, children from different classes got on easily with each other and they took turns in these activities. Background music was played at all times during breaks and lunchtime.

7.3 Demographic background of the children

During the period of fieldwork observation in the school, there were 65 registered children and about 40 of these had PMLD or SLD. The following sections provide a summary of the demographic background of these children.

7.3.1 Gender and age

In the school, there were 41 boys (63%) and 24 girls (37%) in total. Overall, the ratio of boys and girls was 1.7:1 in the whole school population which coincides with the ratios reported in the national survey data of the House of Commons (2006) and Hallahan *et al.* (2005). Furthermore, Fig. 7.2 shows that the gender balance of students with complex needs in the school was different across each age group. Of the school population, the largest group was 16 years old (8 students), followed by 18 year olds (7 students).

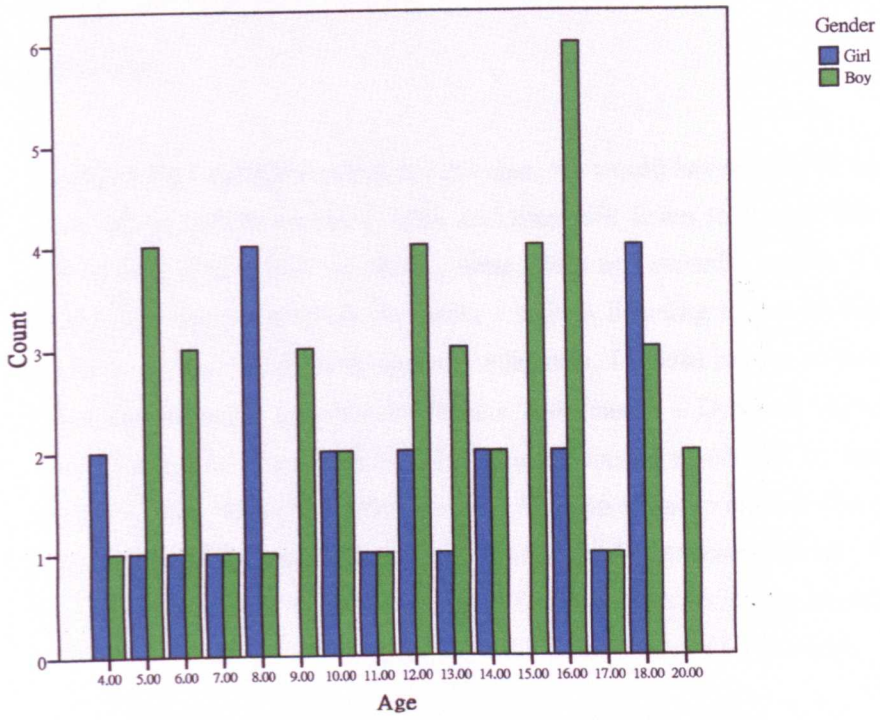


Fig 7.2 Age and gender distribution in the special school

7.4 The children's musical experiences at home

Ockelford (2008) noted that the proportion of time in which music is experienced by children with complex needs is probably similar to that of the general population. He also identified the areas that the children with complex needs are exposed to music in their everyday lives. These include general music education, music to promote wider learning and development, specialist instrumental or singing tuition, music therapy,

taking part in special musical events, listening to live music, listening to recorded music for leisure and incidental musical experiences.

Musical experiences at home

In total, there were 7 interviews with selected parents for the information concerning musical experiences at home. Six of them reported that their children were exposed to many musical experiences either passively or actively at home. During the interviews, mothers showed a positive attitude towards music for their children. J's mother told the researcher that,

> 'When I take J outside or sit down at home, we would have music on and J would ask for it. He loves his brothers' MP3 and they will listen to it together. At home, his brother and sisters play the drum, piano, flute and recorder and they often take the instruments and practice in J's room. J enjoys listening to his brothers and sisters' practice...When I did some massage with him, I would put on some music such as 'Classical moments for you' or 'Perplex and Friends – Dynamic universe'. J has his own CDs that he likes, such as 'There must be more worshiped by Jason Brodie and Rick Hill' and 'Jaheim – Still Bhetto'...He also loves to explore the piano's sounds and presses on the piano. He likes to listen to radio stations such as Classic FM (FM 100.90), BBC Radio 1 (FM 98.50) and tapes or CDs including hip-hop, reggae and Soca [which is a type of Caribbean music]' (case study of J's mother).

> 'Every child listens to music in their life as a living thing. I give him different chances to listen to different types of music, otherwise he'll get bored like any other children. If you listen to one type of music for too long, you get bored. I often take him out and do lots of different things with him...when he likes certain music, he would say 'more' or 'again'. If he does not like certain music he tells you 'no' or 'go' which means 'get out of my room'. I encourage him to express himself more' (J's mother. Note: J was 11 years old at the time).

In the interview, M's mother said that,

> 'I like to put on some music for M on every occasion. When he comes home, I either let him watch TV for children's programme or turn on radio music. He sometimes asks for the radio music to be put on and most of them are popular pieces. Normally during meal time, I turn off the music and let M focuses on his eating because music

excites him and he moves around to the music. He needs to calm down to eat the food... Music is very important for M. Music makes him happy and it also makes him relax. He loves music and I often put the music on to make him happy. When he listens to music, he dances to the music. I sometimes join in dancing with him and we have lots of laughs and fun together' (M's mother. Note: M was 13 years old at the time).

'M loves all kinds of music. He particularly likes watching TV on CBeebies children's programme and FM radio music. M has a collection of DVDs and videos that he likes such as 'Girls Aloud – tangled up' (2007). He got his own TV in his room. In the morning he asks me to turn on the TV for him and he likes to listen to the music from the TV programme when he gets up and get dressed. He has a collection of 'Bob the builder', 'Numberjacks – standing by to zoom!', 'Rainbow', CBeebies 'Balamory – Rain or shine', 'Fireman Sam', 'Tom and Vicky' and 'Superman'. He loves watching X-factor on TV, especially the final competition when the winner sings her/his songs. And he asks me to get the CDs for him. He also enjoys listening to his walkman CD and asks me to turn the volume louder. I have one ear and M has another ear and we listen to the music together. If he doesn't like certain music, he would ask me to turn off the music. Every week, M likes to buy one CD from the shop either a TV programme or popular music' (M's mother).

Researcher's comments

At home, there seemed to be a high incidence of exposure to music and the children were exposed to a wide range of music depending on their own preferences and family activities. Music also functioned as an important means for family bonding. The children had their own music collection and preferred specific musical genres, e.g. popular music. The children often watched and listened to music on mass media, e.g. TV, radio, DVDs, tapes or CDs. The mothers also stressed the importance of music in the lives of their children. Music was treated as part of the natural family activity which provided a variety of choices for different music to be played and interaction to be facilitated. Music was also regarded as a way of self-expression and was viewed as an important component in the families to provide enjoyment and fun in the home. Music was viewed to provide and elicit happiness and relaxation, as well as fun for the

children, and it was integrated with dance or movements to encourage the family bonding. In summary, music was important for relaxation, for family interaction and social events and for sharing.

7.5 General music context in the school

In the school, music was provided in various settings including the school bus, assembly, lunchtime break, in non-music subject-teaching, therapy sessions, music lessons and special music projects. Informal talking and formal interviews were conducted with 17 school staff and some of them worked closely with the participants in the case studies. Their working experiences ranged from six months to 17 years. Most of them were very positive about the general music provision in the school and acknowledged that the children enjoyed going to the music lessons.

The majority of the interviewees (94%) showed great interest in the children's progress, reactions and responses in music. They considered music to be very important for these children in their learning and well-being. Music was used in different subject teaching and five class teachers commented that they integrated the use of music into their own subject teaching. In their experience, they found that the children responded well to music, and music helped to motivate social interaction and in learning specific subjects, for example, numeracy, literacy, PE, religious education and in their choice-making. However, when asked about the children's musical experiences at home, all five class teachers noted that they were not exactly sure as to what type of music individual children listened to at home. The majority of the class teachers and the headteacher commented that most of the parents did not appear to be interested in their children's musical development at school, unless their children were particularly gifted in music.

The following sections will look at the general music provided in the school environment in more detail.

7.5.1 School buses

The researcher interviewed the drivers and their assistants on the school buses. One of the bus drivers said that because the tape/CD player in their bus was broken, they could not put on music at all, and they talked and sang with the children instead. The bus driver also felt that even if they put on music, it was often too loud for the children and the children became quiet. Still, before the tape/CD player was broken, they would occasionally put on music for a child's birthday and during the Christmas season.

The interviewee stressed the fact that the children loved singing on the bus and gave examples of how the children enjoyed singing and making music. For instance, a child in the primary department would copy a few words from the bus driver's singing even though she could not speak well.

> 'We sing, she copies it and we can understand it. The more we sing it, the more she is better at it.'

Another child in the secondary department liked to whistle on the bus. One interviewee commented that

> 'He has got a whistle and has been trying to make a tune to accompany our singing...When he had the whistle two months ago, he just blew it, you know, like at a football match type thing. But now he really plays a tune. That is really good'.

For the buses that did have a tape/CD player, the interviewees commented that they often put on loud music, and that the children liked any music they put on the tape/CD player. They had a variety of different musical pieces ranging from Christmas music, House, Garage, pop to classical music.

Different bus drivers seemed to have different ways to interact with the children socially and musically. Most of them would sing and play music on the bus at the children's request and on festival occasions. They would also dance with the children while waiting in the hall for others to arrive. One interviewee said that,

> 'Actually, [a child] likes certain songs. We might sing one song, then she says, "oh, no", and she can say the name of it. She corrects us and she says, "Oh, I don't want that one, no". She is good, really good'.

The school bus drivers and their assistants mentioned that they interact and 'muck about' with the children while listening to music or singing songs. The children had different song preferences such as rugby songs, 'Swing low, sweet chariot', Scissor Sisters, Amy Winehouse, or some made up songs. They often had many laughs as well. Most of the bus drivers that the researcher talked to in the school car park were very positive about music for children with complex needs, and commented that all the children loved music.

Some parents that the researcher interviewed also said that their children enjoyed the music on the school bus. The children would continue to vocalise and move to the music when the bus arrived home. One parent said that,

> 'He enjoys "school bus music" and that's what he likes. When he comes home, he would tell me that he likes the song played on the school bus and also tells me that he likes the music as well. Sometimes I find that the safety strap has become loose because he was dancing and moving to the music on the school bus. He becomes very excited when music is on.' (child M's mother)

Researcher's comments

From the observation and talks with the bus drivers and their assistants, it appeared to the researcher that music was used to interact with the children as an important social

and communicational means. At times, some children were able to express their preference about the music they liked, and they received encouragement from the transport staff. It appeared that some of the children particularly enjoyed the music played on the school bus and some of the transport staff knew what type of music the children wanted. Music was used as a means of interaction in this more relaxing and less formal context. Musical progress and development for individual children were acknowledged by the transport staff in the children's singing or whistle blowing. Listening to music, singing and dancing/movements seemed to be the main features in the interaction between the transport staff and children.

7.5.2 School assembly

In the school assembly, the headteacher was in charge of what kind of music was to be played. Her decision was made depending on what the headteacher was listening to and themes she wanted to introduce. The headteacher would either play different kinds of music in assembly to share with the children from a certain genre she enjoyed, or she would decide that no music was needed. She would use the music as an introduction to her announcement or as background music when waiting for the whole school to be gathered in the school hall and leaving the hall after the assembly had ended. The headteacher said that:

> 'I choose music I like...last week I played Joy Division, because this was the film I had just watched. I might play classical pieces, the Beach Boys and Arctic Monkeys. I will play some kind of popular music, or I will play Mozart and Beethoven, just depending on what kind of mood I am in really. That's my choice'.

During the researcher's observations in the school assembly, the children's vocalisations and body movements seemed random and did not always have a clear relationship relating to the music that was being played in the background. The children normally vocalised throughout the assembly. If some children vocalised too loudly, the school

staff would attend to the children and try to calm them down. When the headteacher made an announcement, giving the awards of the week to the children, or gave a little talk, they did not have any music on.

On some occasions, certain music was introduced specifically, for example, an Irish piece on St. Patrick's Day was explained as part of the culture. When the headteacher put on the video clips, the sound level from the children seemed to decrease. When the headteacher started speaking again after watching the video clips, the vocal sounds of the children increased (19th March 2007). On another occasion, when the headteacher played some popular music from Garage rock, post-punk and rock and roll, she asked the children whether they liked the music. Some children indicated that they did not like the music. The headteacher said,

> 'you could ask me to change it...if you really want your music to be played in assembly, bring the CD in and I will play it. The music that I don't like is if it has rude words. So no bad words' (27 Nov 2007).

Researcher's comments

Music played in the assembly served mainly as a background for the formal gathering. The children, generally, did not have control over which music was to be played and it was only occasionally that the children brought their own CDs to the assembly during the research observational period. Under this formal context, the children passively received the music that was put out for them. During the fieldwork period, music was played flexibly according to the headteacher's decision. When certain music was introduced as part of a cultural manifestation, it seemed to attract the children's attention and concentration.

7.5.3 Lunch break

In the school lunch breaks, a selection of background music was played most of the time. There were a wide range of activities being conducted in the lunchtime break

which included various sports, sensory room interaction, video games, dancing sessions, karaoke and beauty therapy. Films and educational programmes on TV were also provided as additional choices for the children. These activities were designed to ensure that the widest range of children had the opportunity to take part. These programmes were managed by the lunchtime coordinators in the primary and secondary departments. In the primary department lunch break, the coordinator sometimes would sing nursery rhymes, play guitar and conduct some musical activities.

During the fieldwork observation, the children enjoyed participating in musical activities and showed great enthusiasm as they interacted with the school staff and each other. For example, the coordinator played the guitar and sang several nursery rhymes. The children participated in the musical activities through pressing switches, vocalising and with all other communicational means. They had good fun and the teaching assistants interacted with the children actively in a humorous and exaggerated way. In one activity they sang 'The wheels on the bus go round and round'. Individual children contributed their ideas of what they would do on the bus and the leader sang the children's actions and ideas. J, one of the case study children, screamed with excitement, and matched his vocalisation within the temporal space that the coordinator left for him to join in the song (17 April 2007).

In another musical activity called 'Slow and fast parachute', the leader played contrasting musical styles, e.g. slow and fast music on the CDs and asked the staff to move the parachute according to the speed of the music. The children were excited about the experience. Some of them came to hold the edge of the parachute and some of the children lay underneath the parachute with great concentration watching the movement of the parachute while the light and colors penetrated through it.

During the interview with the lunchtime coordinator, he commented that

> 'One of the things we do is the slow parachute and the fast parachute. Where you get the slow music interrupted and suddenly made to go fast. Maybe not all the kids like that but some of the kids think it is very funny. So it's just an experiment...then you might want to brighten them up a little bit just to get them going when you want them to get moving, and then chill out when you want them to chill out'.

In the interview, the coordinator said that the music he sang or played in the lunch break was intuitively chosen, and the kind of activities depended on how many staff he had on that day. It appeared to the researcher that the background music was chosen by the school staff on personal preference and it also depended on chance as to which music CDs or radio were available at the time. The coordinator explained the situations that he encountered,

> 'It depends on what staff you have on that day and you only find out at the last minute. If somebody is off on holiday, or sick... it affects how many people you have. Then if a pupil needs personal care, two of my staff must disappear with that child... It is rather difficult for me to organise things but it is up to me to do the best I can under the circumstances'.

In other interviews, several school staff commented that they needed to buy more CDs and that many of the CDs that they had in the school were out of date. The coordinator noted that it was important to provide opportunities for the children to experience different kinds of music e.g. pop, dance or rock music as for children in mainstream schools. He commented that,

> 'It is always easy to put on background atmosphere music to pretend you are in the ocean and they never get to hear stuff mainstream kids might hear, might be rock music and why shouldn't they? By saying that, we do need to get a better variety of CDs and music into the school. They tend to be ignored and sometimes it can be what the adults like rather than what the children like...So there should be no differences made in the special school from that made in the mainstream'.

Researcher's comments

The lunchtime break seemed to provide a flexible and playful environment socially and, sometimes, musically for the children. This demonstrated the constant use of background music and, occasionally, purposeful musical activities when interacting with the children. The expertise of the lunchtime coordinator also determined what kind of musical activities were available for the children. Music served as a background stimulus, an introduction to certain activities, experiment for fun and also as a means of engagement and interaction. Music was chosen on the intuition of the school staff, and selections of musical activities depend on the number of staff and children available.

7.5.4 Classroom

Music was used in the classroom for different subjects and for different purposes. The researcher interviewed four classroom teachers and they all showed positive attitudes towards using music in their subject teaching and the children's responses towards music. The classroom teachers said that:

> 'It often comes down to percussion or you use switches or clapping along with it...and on that level that doesn't seem like very much, but the response...It's a very genuine response. The joy, the happiness and the feeling that we all like music and we all join in' (Classroom teacher L, secondary department).

> 'We sometimes use it for pupils to make choices on what they like to do. There might be eight different things they could do. One of them might be to put some music on, so they got a choice that they can go to the CD player, chose a CD and listen to it. We use it on a Friday afternoon for approaching a theme...we had themes on "a different country"... so we heard quite a wide range of music from different countries' (Classroom teacher L2, secondary department).

> 'When I do maths lessons, I always start with the same song every lesson because a lot of the students don't really understand what lesson they are actually having. So sometimes listening to some pieces of music reminds them. Ok, this is a maths lesson and also at the end of the day they know that it means "home time" when they hear a certain piece of music. It's accessible for the students, either by just having the enjoyment of listening to some music or by playing as well – even if through just

> very basic tapping on the tray or by pulling some strings on a guitar' (Classroom teacher S, secondary department).
>
> 'I use a lot of number songs, because there is a lot of repetition that the kids like. I use musical instruments during a story, and things to crash and bang. If I am trying to tell a story about two things linking together, I use musical sounds just to help students to imagine the story a lot more... So I use them much of the time in different settings. Although I mainly use them in maths and English, it cuts across the whole of the curriculum' (Classroom teacher M, primary department).

Each classroom was equipped its own CD/cassette player, computers, smart board, projector and speakers. Normally, only the school staff used these facilities. Many of the children seemed to enjoy using the computers and had access to various educational software which had different kinds of music and sounds for children to choose and interact with. The smart board also provided instant feedback of musical sounds when the children selected either the right or wrong answer by using their switch.

Researcher's comments

Music was used to elicit response and to create a sense of belonging, joy and happiness, which can be integrated with dancing and other sensory activities in the classroom. Development through music was addressed and emphasised by the classroom teachers. Music was used as a way to introduce different cultures/countries and for orientation of different subjects teaching to bring the class together. Music was also used to facilitate imagination and association, and to show the children's individuality. It was regarded as important that music was accessible for the children through listening and playing. Musical repetition was regarded as one of the main features which contributed to the children's preference and to the familiarisation of the musical materials. In summary, the classroom teachers used music for morning greeting and at the end of the school day, for choice making, for enrichment of their curriculum content and subject knowledge, for interaction and instant feedback, for relaxation, for social events, for symbolisation

of other sensory activities and for motivation, enjoyment and fun.

7.5.5 Therapy sessions

In the school, children attended their individual sessions for speech and language therapy, physiotherapy and occupational therapy. During the fieldwork observation, a speech and language therapist came to music lessons for a few times helping specific individuals to use their communicators. In order to find out how the therapists use music in their session, an interview was conducted with the speech and language therapist. She commented that,

> 'I use music in a number of ways because it's really motivating for the kids, for our kids here in particular. Sometimes, I use music in kind of very early communicators when we use music as turn taking, interactions, either with instruments recorded on the switch or just by using instruments, gaining attention and joint attention development, kind of thing. We used to use music with more high-tech communicators, so students used AAC devices[1]. I download some CDs onto their devices, so they can play their music for their friends or use it as a DJ device. Also as song challenges...so they'll play a section of music, and whoever they're chatting with will have to guess what the next line might be and to see if they are right. So, yeah, there are a couple of ways to use music (a speech and language therapist).

> 'It depends on how much motivation there is for the pupils and on what level they are at. I'd say that for probably 75% of the pupils, I've used something that are linked to music in some way or something musical with them in therapy... For some of them, it might be using some singing techniques to develop their breath control for speech. I taught about using snips of preferred music as motivator for them to use their communication system. So there are different ways of using music, but probably with 70 to 75% of my cases I have used some musical techniques at some point' (a speech and language therapist).

[1] Augmentative and alternative communication (AAC) strategies assist people with severe communication disabilities of those who have little or no functional speech and/or physical disability to improve their communication skills and to participate more fully in their social roles (http://aac.unl.edu/). The field of clinical and educational practice uses supplementation or replacement of natural speech and/or writing using aided or unaided symbols to help people when they find difficulties in expressive communication using hand-signs, writing, or typing (http://www.aacinstitute.org/AAC.html).

Researcher's comments

In the speech and language therapy sessions, music was used as a motivator in turn–taking and as a means for engagement and interaction between therapist and the children. Music was also used as an early communicator to gain attention and to develop joint concentration from the children in a group context. Motivation was stressed for the development of cognition. The therapist used various ways in music and singing – frequently as a complementary means to achieving the children's learning targets, e.g. breath control in the therapy session.

7.6 Music lessons in the school

Children aged 5 years old onward had music lessons once a week, led by a specialist music teacher in the special school. Each music class had around seven children. One to three teaching assistants, who were largely women, facilitated the children's learning in the music lessons. The music teacher worked part-time for two days a week in the school and he only taught music, with no other duties or teaching responsibilities. He specialised in music education and he was recognised as an advanced skills teacher. The music teacher started teaching in the school from the academic year 2004/2005.

Most of the music lessons occurred in the school hall near the corner where the piano was located (see Fig. 7.3). Percussion instruments were stored in a room off the hall. The school hall was the biggest and tallest room in the school and the acoustic environment sometimes had reverberant effects.

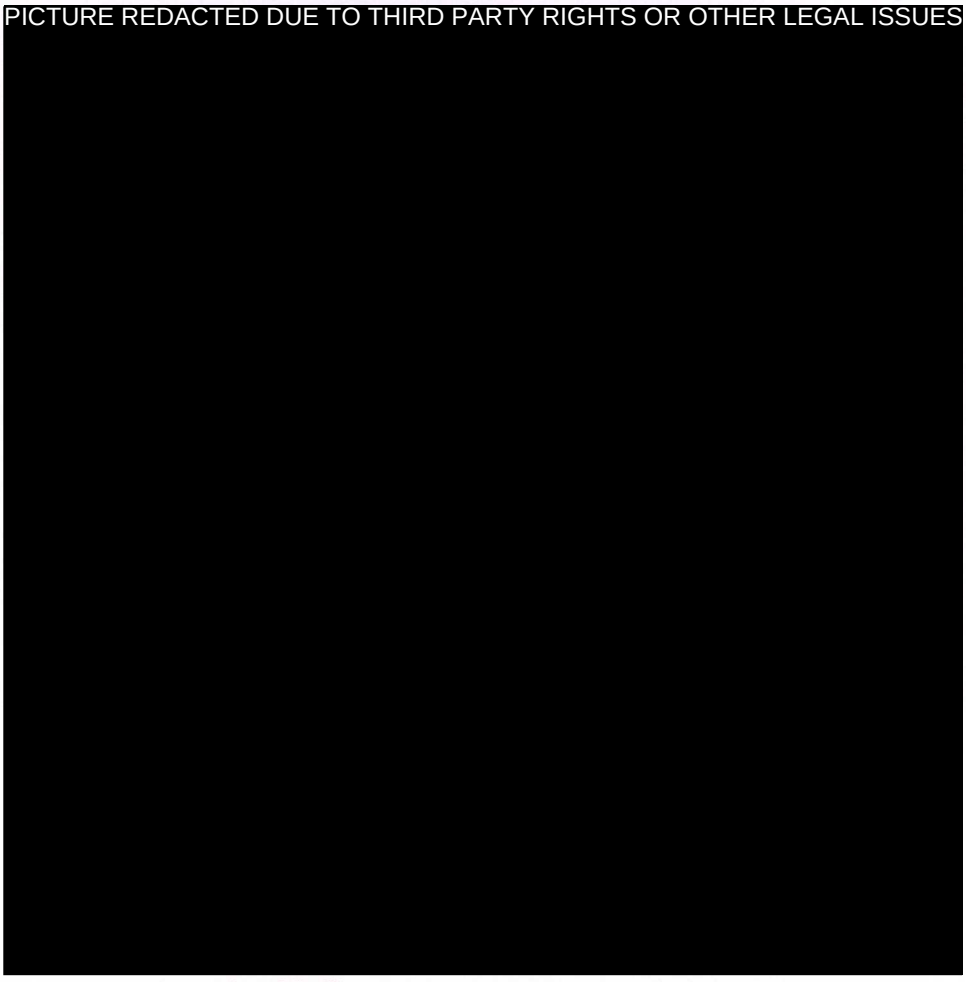


Fig. 7.3 The school hall

There were a few occasions where music lessons took place in the music teacher's office (see Fig. 7.4), which was a small separate room outside the school hall, when the lessons were designed for using music technology. Because of the small space, it was hard to accommodate all the students and teaching assistants (TAs), and the slope to the office made it difficult for wheelchair users to access. After several attempts, the music teacher decided to move back to the school hall for the music technology lessons. This increased the teacher's work in carrying all the equipment and setting it up in the hall, but with better results in terms of the accommodation and small group work.

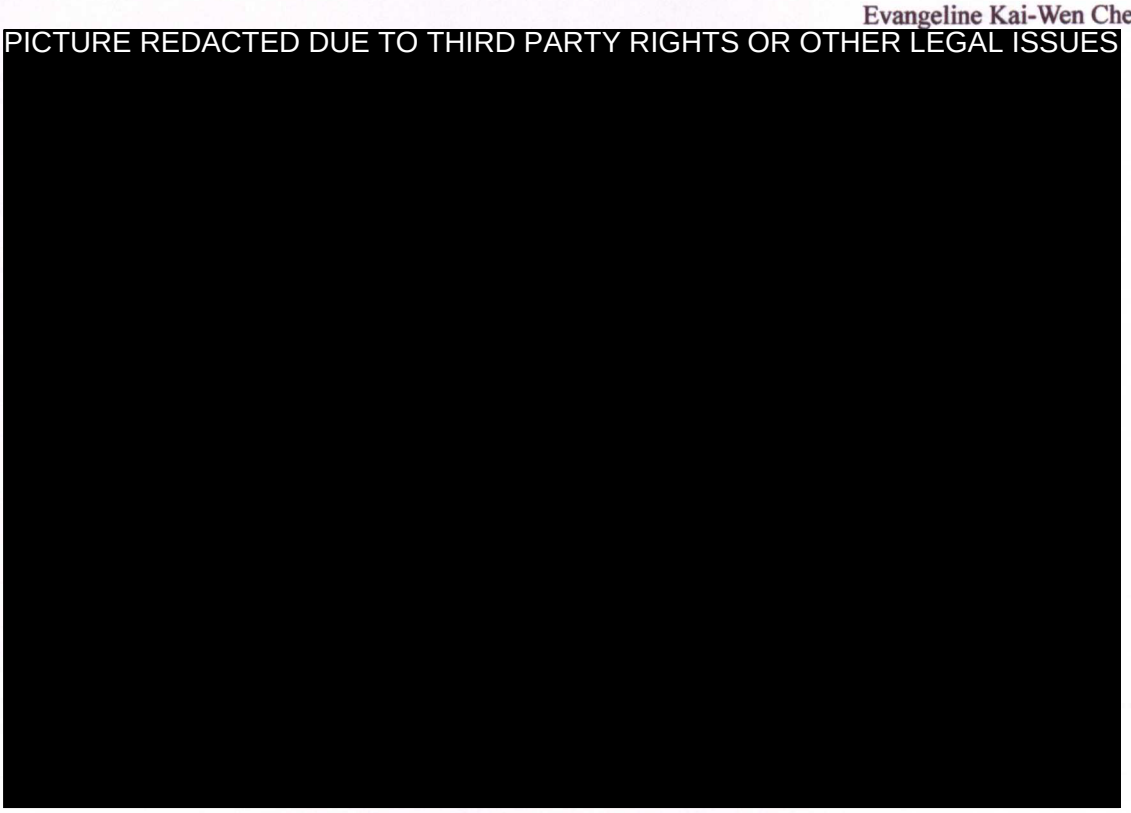


Fig. 7.4 The music teacher's office

7.6.1 The aims of the music teacher

When interviewed, the music teacher stated that his teaching aims were to focus on both musical and extra-musical aspects of the children's development. The musical aims were to increase the children's musical independence and to develop their musical skills, for example,

- to increase the number, the intensity and different types of children's responses;
- to develop accuracy of musical timing in their responses.

The extra-musical aims were to use music as a vehicle for participation, for communication and for decision making. The music teacher believed that through the use of musical activities, the children gain a sense of self, can have fun and enjoy themselves. In the interview, the music teacher emphasised that the extra-musical aspects of development were as important as musical development in his design for each lesson.

7.6.2 Music curriculum content

The National Curriculum for Music in Key Stage 1, 2 and 3 focus on pupils' 'knowledge, skills and understanding' which are organised from the areas in 'listening, and applying knowledge and understanding', 'performing skills', 'composing skills' and 'appraising skills' (DfEE and QCA, 1999, p. 6). These aim to promote the children's spiritual, moral, social and cultural development and key skills through music. Broadly speaking, children develop their musical skills through exploration of 'sounds and silence' in Key Stage 1, 'music from different times and cultures' in Key Stage 2 and making 'connections between different areas of knowledge' in Key Stage 3. DfEE and QCA (1999) stated that 'curriculum planning and assessment for pupils with special educational needs must take account of the type and extent of the difficulty experienced by the pupil' (p. 27).

In the interview, the music teacher told the researcher that the music curriculum was

> '...loosely based on the QCA scheme of work and largely based on Key Stages 1 and 2. There are lots of elements in Foundation stage and some elements from Key Stage 3'.

During the interview, the music teacher talked about the music curriculum as being 'organised to build up children's musical skills and responses slowly'. It also had space for children to respond on their own initiative: such actions were addressed and acknowledged even though they may seem to be a diversion at the time.

The music curriculum framework designed by the music teacher was task orientated. In the music teacher's documentation, children worked in the areas of: participation; tempo and dynamics; identifying instruments and their sounds; phrasing; performing to the beat; transferring text to rhythm; imitating movement and rhythm; singing high and low pitches; recognise notation for ta, ti-ti and sh (which are a crotchet, two quavers and a

crotchet rest respectively); accompanying song material; singing a sol-mi motive with hand signs; listen to teacher's singing and sing back; play and move to music in binary form (AB); improvising and composing; texture and listening. In the teaching observation, the music teaching demonstrated an eclectic mixture of the music activities, which was based on the perceived individual needs of the children, the number of TAs and environmental/event circumstances in relation to the scheme of work and weekly record music.

Researcher's comments

Through the researcher's observations, many of the music activities demonstrated a strong affinity with the early years or so called 'Foundation Stage', which might reflect the developmental age of the children despite their chronological age. Compared with an observation of the same music teacher teaching in another mainstream school for reception age children, the researcher found that there were many similarities in terms of the materials and teaching strategies that were used in both settings.

7.6.3 Teaching strategies

In the interview, the music teacher reported that the music curriculum and teaching strategies were taken from Orff and Kodály's work to help the children to experience the building blocks in music in what he termed as 'a progressive way'. The music teacher commented that,

> 'So they are starting off with feeling the pulse and then rhythm. If it's two beats in the bar, which a lot of the music is, it is divided into strong and weak. Rhythm is the subdivision of the beat of the pulse. And then very simple melodic motif, usually start with Kodály things which start on Sol Mi, and then adding in one more at a time and building up slowly'.

The reasons for the music teacher's drawing on these two approaches to music pedagogy were that, firstly, he was trained in Kodály teaching and secondly, he thought

it was appropriate to integrate the teaching strategies and music scheme of work from both pedagogies into his own music teaching and curriculum planning. The teaching techniques that the music teacher used in the music lessons were summarised as follows:

- use unaccompanied singing and systematic use of singing at all times;
- use sequenced learning in rhythmic and melodic concepts which derived from the selection of the songs;
- offer training in pitch and rhythm;
- use relative somization – moveable-do;
- use of hand signs;
- use rhythm duration syllables – ta, ti-ti, sh;
- develop good awareness and understanding of the language of music, e.g. the ability to clap a rhythm, sing in tune, or read rhythmic symbols;
- use listening games and question and answer songs with playful approach provide opportunities for learning from others.

In real music teaching, for example, the music teacher used hand-signs when singing a short and simple tune to the children. The children were asked to either repeat the singing or imitate the hand-sign actions. For most of the children, the teacher held their hands up and down while singing, in an attempt to give them a sense of high and low in the pitch and in the physical space. However, it was difficult to tell if the children really understood the hand signs for those who could only use a switch due to their physical disabilities and cognitive difficulties.

The music teacher also used rhythmic chanting to convey a sense of rhythm and the recognition of musical symbols. The children were asked to copy or give an answer

whilst the music teacher showed them the flash cards as visual prompts. A few of the children were able to read the rhythmic cards and performed the rhythm correctly in a structured musical activity. For the majority, the teacher would record the rhythmic chanting on a switch[2] and ask the children to press the switch while presenting a rhythmic card to them. However, it was hard to tell how much the children understood the meaning of the chanting in relation to the musical symbols while using the switch. Some children could have just simply pressed the switch whenever the switch was presented to them.

When demonstrating certain musical activities or interacting with the children, the music teacher used dramatic and playful techniques to keep the children's attention and interest. He thought that this way of teaching motivated the children's learning. The music teacher also used role-play to elicit children's responses and he commented that in many of the cases it did seem to work. For example, when introducing the Carmen opera, the teacher and children would engage in role-play on the characters of bull and bull fighter. The children were observed to respond well – with a humorous and playful approach – when the teacher delivered the curriculum with exaggerated singing and face-to-face interaction as in Intensive Interaction (Corke, 2002; Nind and Hewett, 2005).

In the fieldwork observation, it seemed that the children were learning how to relate to each other and to develop their own individuality through making music (Schalkwijk, 1994; Wigram, 2004). The music teacher emphasised the use of unaccompanied singing in most of the music lessons. He said that,

[2] Switches are part of the assistive technology devices. They can be categorise in 'computer access and instruction', 'environmental control' and 'recreation and leisure aids' to address functional capabilities of students with disabilities (See http://www.gpat.org/resources.aspx?PageReq=GPATDef).

> '...the good thing about the Kodály work is that from one tiny little song you can get an awful lot of work out of it as well as a lot of activities. So even though it is the same material, it doesn't get boring because you are doing something different each time, and you can always extend it...it's called 'teaching music through music': practice first and theory afterwards'.

When working with the children, the music teacher aimed to extend the children's work from where he perceived they were. The music teacher also incorporated the use of switches to increase the active participation from the children in the singing and turn taking. The music teacher told the researcher that it was very important to have a good sense of humour and the capacity to be flexible when working with these children. The music teacher noted that

> 'an awful lot of it happens on the way because things turn up and I think it is very important to react to what comes up and go with that, no matter what I planned'

When working with the secondary department on the 'Garageband' composition software[3], the music teacher commented that,

> 'their responses kind of flatten and seem less joyful when they are using technology rather than when it is face-to-face that's sort of intrapersonal work...I quite often feel they don't enjoy ICT work as much as kind of face-to-face work'.

In the beginning of each music lesson, the music teacher always sang a 'hello song' to start. It appeared to the researcher that the children responded and reacted very well to these familiar songs. Having used the same 'hello song' every week for two to three years, the music teacher thought it was almost like a ritualised beginning and believed that it helped to bring the class together. It seemed to the researcher that the familiarity

[3] A music software called 'Garageband' was utilised to help young people to compose music and create various sounds on different sound tracks. The music technology largely comprised a wide range of instrumental sounds, natural sounds, musical genres, and rhythmic patterns. A few children would participate in sound improvisation and in choice making among a selection of sounds or backing tracks. School staff helped the children in presenting their choices with a reproduction of a piece of music and created the actual recording. When the children listened back to their recordings, a few of them would vocalise with excitement. After these sessions, the music teacher also made the recordings onto a CD for one of the classes in the secondary department.

of the songs both heightened the expectation of the lesson to come and relaxed the children. The music teacher remarked that,

> 'It's just something that they can instantly know it's the start of the music and we are all doing it together... [they know] what's going to happen and it's very secure. They have a sense of expectation... sometimes you can get them working in pairs, so it is quite a nice way to get them into interacting with each other at the very start. The material is very familiar and that's the security which I think they all like'.

Researcher's comments

During fieldwork observations, the researcher found that young people who had complex needs responded with less interest when it came to choosing a sound track from the computer or arranging/composing different sound patterns together to make a new pattern of sounds. This may be due to their difficulties in understanding the 'Garageband' computer software. As might be expected, using the mouse was not easy to access for all the children who had severe physical disabilities. However, many children did show great interest when exploring other ICT facilities, such as, the Soundbeam[4] for free improvisation during the lessons.

7.6.4 Music assessment

The school assessment system for music was called B Squared (http://www.bsquaredsen.co.uk/open.htm). B Squared assessment was a way of interpreting the P-levels and it broke down P-levels and the National Curriculum into small steps. The assessment was set to enable the school to track the children's progress through each level (see Byrom, 2005; http://bsquared.co.uk/index.php). Most of the children's attainments were in the category of P-levels. The music teacher mainly assessed the children's P-level first and then documented and dated their performances within that level to report back to the other school staff. There was also an informal assessment taking place at the end of every session when the teacher gave positive

[4] Soundbeam is a device which uses sensor technology to translate body movement into digitally generated sound and image (See http://www.soundbeam.co.uk/).

verbal feedback to the individual child. In addition, the music teacher kept a weekly record for personal reference (see Appendix E). For some of the children in the primary department, the music teacher would also write a paragraph in their annual report describing the children's musical progress (see Appendix F for an annual report of a case study).

When talking informally with the music teacher, he commented that he felt that the P-level system was not very useful in terms of documenting the children's progress in different areas in the music curriculum. During the time of the researcher's observations, the music teacher developed his own assessment tool alongside the school assessment to record the children's attainment (see Appendix G). The music teacher also used his own assessment to consider the nature of the music curriculum and the overarching assessment goals across different age ranges in conjunction with the individual children's learning targets. He remarked that he tried different ways of assessing the children and hoped to refine one assessment that would enable him to form some kind of picture of the children. In addition, the music teacher commented that,

> 'I think it's very, very difficult and much harder to assess than mainstream. Because so much of the work I do is exploratory rather than kind of objective based. You can't say "by the end of the lesson you will be able to", or you know, because they will never be able to do that. So you can say by the end of the lesson you will have explored something and yes they have explored something at the end of the session'.

> 'Where some of the students like [A], whom I think intellectually gets nearly everything of what we are doing, but can not physically reproduce it. I mean he can't produce a steady pulse, for example, and he can't sing or play a simple melodic motif...You can't assess on his performance but I feel from his other work he almost understands it and he does know that he can do it – but that he can't do it physically'.

Researcher's comments

The music assessment for children with complex needs was considered by the music teacher as a difficult task compared to in mainstream settings. The P-levels for music did not seem to help the music teacher in his assessment and curriculum planning. As a result, the music teacher was left alone to design his own way of assessing these children. The multiple disabilities of the children hindered the manifestation of their learning outcomes, despite the possibilities that they may intellectually have the musical knowledge and skills. This situation made it difficult for the teacher to evaluate the children's musical behaviours and development.

7.7 Extra-curricular music projects

The children had a good range of extra-curricular musical activities in the school. During the researcher's fieldwork observations, a few extra-curricular music projects took place in the school. A professional orchestra had supported the school for many years. Several classes were invited to go to the Barbican Centre to listen to and participate in the orchestra educational programme over the years. At other times, several of the professional musicians came to the school to give ensemble concerts with story telling.

From the observations, some of the individual children interacted with the storyteller enthusiastically and acted as a conductor to perform a certain gesture which enabled the musicians to produce certain sound effects to fit in with the gesture and the story line. The children were excited about the event and they participated well, when given opportunities to engage with the music making or certain actions in the play, e.g. to wave hi, hide a magic pencil, name the instruments, or touch bubbles. The researcher observed that many children enjoyed having the opportunity to listen to the instruments

being played in front of them and experiencing live music.

'Music Makers Sing' project

A specific music project called 'Music Makers Sing' was organised by the orchestra involving a range of different primary mainstream schools and a class of children from the primary department in the special school. Music technology and switch pads were used to enable these children to perform two songs, with accompaniment by a violin and a cellist. After seven weeks' rehearsals in the music lessons, these children performed on the stage in the Barbican Centre with the orchestra and other mainstream school children.

On the stage, some of the children showed their excitement with big smiles and expressive physical movements, e.g. held their hands in the air, and many of them engaged well in the music making by using switches. There was one child who found it difficult to concentrate and listen to the music, and who needed constant reassurance from the school staff to calm him down and help him to focus. Each child was allocated to one staff member for support, including the researcher as part of the team. Parents and the headteacher attended the concert and reported that they were pleased with the children's performances. This music project integrated well into the music curriculum in singing, recording voices, turn taking and familiarising with the songs in the music lessons (For more detail, see Chapter 8 for the case study of J).

Most of the musicians who came to the school did not specialise in working with children and young people with complex needs. Indeed, two of the orchestra members who worked with the children in this project commented that this was their first opportunity of working with such children. Nevertheless, they had enjoyed the experience and were very positive about it.

Jack and the Beanstalk musical

In December 2007, the secondary department performed a 'Jack and the Beanstalk' musical. The project was organised by the music teacher and class teachers, and this integrated very well into the music curriculum. The children practised the acting, movement, singing, saying certain words, and pressing switches at the right time when it was their turn. These experiences also seemed to help their understanding and enjoyment more, both in their performing and being part of the audience.

The material of the 'Jack and the Beanstalk' musical was the version from Matthew White and Ana Sanderson (2001) Ronald Dahl's 'Jack and the Beanstalk – A Gigantically Amusing Musical'. The accompaniments, with various orchestrations, were recorded on a CD. The musical was arranged and divided between different classes in the secondary department and each class performed one scene. Each class could also decide whether to use the CD, sing the song, do the actions from the book, or choose their own music as theme music when performing. The music teacher, the class teachers, and TAs worked together in helping the children and young people to learn the songs and rehearsed many times both inside and outside their music lessons.

The stage was situated in the school hall. Each child was assigned one of the school staff and they performed together, either in singing, acting, dancing, or pressing the switches to contribute to the story telling. The music teacher read the script and played the music from a CD player. The secondary department director was in charge of the power point and a technician was looking after the technology equipment, including the lighting and microphone.

On the performance day, the school staff gave the children switches when it was their turn to say their words which were pre-recorded on the switch. The school staff also

pushed the children's wheelchairs when changing stage positions or showed the audience flash cards as a prompt in anticipating the musical. All the costumes and performing equipment were made by the staff. Many children showed great enthusiasm in participating in this musical event. The children seemed very excited when putting on specially made costumes and many of them had good timing when pressing the switches and showed great interest in watching others perform (for more detail, see Chapters 9 and 10 for case studies of K and H).

The end-of-term production of the musical was impressive and enjoyable to watch. The music teacher commented that this was the first time in three years that the whole secondary department had performed together in a musical project. At the performance, families and friends were invited to the school. A good number responded and the school hall was packed with children and young people, as well as families and the school staff. After the performances, many of the parents gave positive feedback to the school staff about the production, and seemed very pleased.

Researcher's comments

These two projects were integrated in a systematic way within the music curriculum. This appeared to be due to the music teacher having a prior personal contact with one of the members in the organisation or being involved in the projects and knew the event in advance. For these projects, the music teacher, school staff and other professionals worked together with the children to practise and to present these productions. The music teacher rehearsed, previewed and reviewed these extra-curricular projects in the music lessons. As for other extra-curricular events (see Appendix H), they had little or no connection with the formal music curriculum, and seemed to be 'one-off' events. However, these activities also appeared to enrich the musical experiences of the children at the school.

7.8 Summary

This chapter provided the detailed contextual backgrounds of the children and young people within this research. It reported the characteristics of the special school, musical experiences at home and the music provision in the school. These contextual backgrounds may shape the children's experiences and development, and it is in these educational contexts that the case studies, presented through Chapters 8 to 10, are embedded.

Through fieldwork observations, interviews with school staff and home visits, it appeared to the researcher that there was a permeation of musical activities and musical experiences that occurred frequently within the lives of these children with complex needs.

As described in this chapter, the exposure to music occurred at home and in the school within the context of the school bus, school assembly, lunchtime break, classroom, therapy session, music lesson, special musical events and other school events. Both in the school and at home, the children seemed to be exposed to a high incidence of varied music.

The school staff showed a positive attitude towards the music provision in various settings in the school. The parents and school staff stressed the importance of music in the lives of these children in the area of development *through* music. Music was utilised as a means for communication, interaction, cultural manifestation, choice making, motivation, orientation, attention and cognitive development.

Chapter 8

Case study analyses of J

8.1 Introduction

This chapter presents one of the three case studies to provide a detailed example of how musical development may occur in children with complex needs. The analytical technique derived mainly from the newly developed assessment procedure in Chapter 6, which was based on the latest *SoI* framework. Several analytical perspectives are provided, including weekly data analyses, weekly profile analyses and phase analyses. Relevant stack and concentric profiles are also provided to facilitate and illustrate the data analyses of the student's musical behaviours over a period of eight months. In order to protect the participants' anonymity, the researcher refers to these students throughout using one-letter labels. In this chapter, the child under consideration is called 'J'.

The chapter is organised into five main sections. Section 8.2 provides background information about J. Section 8.3 offers several examples of detailed weekly coding and comment concerning J's musical behaviours. Section 8.4 has examples of transcriptions of several video extracts and their detailed analytical coding and comments. Sections 8.5 and 8.6 then offer weekly musical development analyses of J over eight months, and phase analyses which are based on stack and concentric profiles of J across two phases.

8.2 Background information of J

J was 11 years old when this research was conducted. The school documentation in J's Individual Educational Plan (IEP) file recorded that J's disabilities included visual impairment, cerebral palsy, epilepsy, severe learning difficulties, physical disability and

speech, language and communication difficulty. J was a wheelchair user. His ethnicity was Black Caribbean and his mother tongue was English. He had two brothers and two sisters in his family. At the time of the research, J was able to say a few single words including 'hi, bye, no, me, more, book' and a few staff members' names who had been working with him for years. He would nod for 'yes' and speak in loud voice.

The school record in J's IEP file stated that J needed help in daily living with feeding, moving around and toileting. He liked to use a switch device to relay a message from home in the morning and to use a switch for conversations around the school. It was reported that he loved being helped to do things with his hands in different classes. J seemed to be able to see things only when objects or a switch were placed in front of him on his tray during the fieldwork observations.

Across the fieldwork observations, J's seizures appeared to be under control, probably due to the effectiveness of the medicine that he had been taking, and no incident had occurred. He could sit upright by himself without head restraint, but occasionally dropped his head when he became tired, dozed off or appeared to had lost concentration and interest. J was able to make choices when two options were given to him, accompanied by symbols or a verbal prompt.

The school documentation in J's IEP file stated that J needed 'firm encouragement' to maximise his potential for learning. In general, J liked doing tasks that had been requested by the school staff. His IEP target in the autumn term 2007 was

> 'To choose a known preferred option from a choice of three during choice making activities. He will do this using a step by step switch (recorded with the options) and a verbal 'yes' and 'no' to select. He will achieve this at least 6 times over this half term' (school documentation in J's IEP file).

8.3 Examples of weekly musical behaviours comments and analyses of J

For J, the observational period was 22 weeks across two school terms from November 2006 to July 2007. In order to increase the reliability of this research, the researcher decided to only include recorded observational data from the sessions that were video-taped and/or captured as sound files[1]. The field notes were also used as an additional resource in the study. In weeks 1 and 2, the researcher was exploring and orientating herself in the environment. In weeks 4 and 13, J was absent. In weeks 8 and 9, the researcher experienced technical difficulties with the sound recording technology. Therefore, the formal recording of J's musical behaviours started from week 3, and video or audio data for weeks 4, 8, 9, and 13 were not available. Consequently, the total number of weeks with available data were in total 16 individual data entries.

For the observational period, the musical behaviours and development of J could be divided into two developmental phases. A special music community link project called 'Music Makers Sing!' served as a virtual separation point between what are termed in this chapter as phases one and two[2]. This project changed the nature of the music lessons being offered by the addition of two professional musicians and a music technician. For phase one, the starting point was when the researcher went into the school and began her fieldwork observations, and the end point was the week before the

[1] Example observations on video were examined with the supervisory team to ensure that the applied assessment procedure was being applied in a valid and reliable manner.

[2] From week 15, the children in J's class started to work on a special music project called 'Music Makers Sing!' with a well known professional orchestra as part of the orchestra's discovery series. The children started to use the switch pads in singing two songs called 'hop along popcorn' and 'sugar cake'. Subsequently, they performed on the stage with the orchestra in the Barbican Centre in week 21. The music project involved 7 different schools, one youth choir, one instrumental learning programme, the orchestra and special guests. This project was supported by Cripplegate Foundation, Finsbury Educational Foundation, Peter Harrison Foundation, Capital Radio's Help a London Child and the Marina Kleinwort Charitable Trust. The children's family members were also invited to go to the concert in week 21.

music project was launched. For phase two, the starting point was the beginning of the special music project and the end point was the week that the project finished. Therefore, phase one was from week 1 to 14 and phase two was from week 15 to 21.

Overall, 543 moments of musical engagement of J were noted over the fieldwork observational period (see Table 8.1). When allocated to the three *SoI* domains, there were 191 events in the reactive domain, 201 events in the proactive domain and 151 events in the interactive domain. For the whole observational period, there were an average of 12 events in the reactive, 13 events in the proactive and 9 events in the interactive domain per observational week (see Table 8.2).

Table 8.1 Distribution of observation weeks of J

Distribution of observation over eight months				
WK	R	P	I	All
03	10	6	9	25
05	17	18	11	46
06	11	11	7	27
07	8	9	3	20
10	17	19	18	54
11	19	25	15	59
12	19	22	16	57
14	5	6	3	14
15	16	20	15	51
16	4	5	3	12
17	5	8	4	17
18	6	5	4	15
19	11	10	11	32
20	10	11	9	30
21	27	22	20	69
22	6	4	3	13
Total	191	201	151	543

Table 8.2 Distribution of musical engagement moments across the reactive, proactive and interactive domains of J

Distribution of observations in the three domains			
Phase	R	P	I
01	106	116	82
02	79	81	66
Post project week (last week)	6	4	3
Total Observation Number	191	201	151
Total Weeks	16	16	16
Average Observations/Week	12	13	9

The following sections provide some examples of the detailed observational descriptions, coding and comments of J's weekly musical behaviours and development. They were taken from the first weeks of observation (weeks 1 to 3), a week during the middle of the observation (week 12) and one towards the end of the observational period (week 21). For details on the rest of the weeks' observations, see the Appendix I.

Initial impression in weeks 1 and 2

The researcher's first impression with J when she met him in November 2006 was that he was quiet and had only a short concentration span during the music lessons. The music teacher commented that J often dozed off during the music sessions whilst the teacher was working with other children. J did not participate much on his own initiative.

J's main non-verbal communication was through vocalisation, facial expression and body movement. J needed full support with his instrumental playing due to his physical disability which meant that he could not hold a beater or instruments to play. He would look where the sounds came from and showed an emerging awareness of sounds, especially when someone came through the door or when school staff members talked to him. At times, J would produce fleeting reflexive vocal sounds relating to certain

social interactions or musical contexts. In the lunch break observations, J often sat in his wheelchair and sucked his thumbs quietly. Sometimes it seemed that he merged into the background when situated in a big group context.

However, he engaged well in one-to-one interaction, especially when the music teacher sang a familiar song to him, for example, the 'hello song' in the music lesson. He would vocalise 'hello' back to the music teacher within the musical phrase clearly. J seemed to recognise the musical structure of the repeated 'hello song' which the children had sung for two to three years. He started to respond actively using his vocalisation when the music teacher sang the song in the beginning of each lesson.

Week 3

During the third week, J responded to the 'hello song' through using vocal sounds. J had responsive and direct intentional vocalisation to the teacher's direct face-to-face greeting in singing the 'hello song'. He vocalised with the teacher's singing and he could sing his name clearly and appropriately in the 'hello song'. It seemed that he knew the music sequence and understood when he needed to respond in the song (coded within the SoI framework as R4A, P4A, I4B[3]).

In a musical activity called 'Coo, coo, where are you?' the teacher wheeled J to sit in front of the class and turned him around. J was asked to guess which child played the triangle when the teacher sang 'Coo, coo, where are you?' (s m ss m). J had several wrong guesses in the beginning and then he began to get the answers correct. It was hard to say whether J was able to distinguish the instrumental sound quality or recognise the direction of the sound when facing away from the sound source. However,

[3] Where an observation embraces more than one type of categorisation, then more than one SoI framework number and level are indicated.

he was able to imitate the teacher in saying the child's name who played the triangle (coded R3A, I2D). J also allowed the music teacher to hold his hands to tap a rhythmic pattern (♩ ♩ ♫ ♩) on his tray while the teacher sang 'Coo, coo, where are you?' (R3A, I2C). In a similar group activity, J formed fragmentary responses through his vocalisation along with the teacher's singing (R3A, I3A).

J enjoyed laughing within certain social contexts. For example, he giggled at the teacher's exaggerated animal sounds while chanting the rhythmic sequence: quack, quack, quickie quack! (♩ ♩ ♫ ♩) and took his hand to point to the rhythmic card (R2B, P2B, I2A). When given enough time, J was able to respond and said the last word of the rhythmic chanting through imitating the teacher's sounds (R3C, P3A, I3C).

In recognition of musical symbols, J was able to say the first and last word 'ta' of the rhythmic sequence on 'ta ta ti ti ta' (♩ ♩ ♫ ♩) a few times in the lesson. Especially with the last word 'ta', J would say it with a loud, expressive, and confident voice which probably showed his awareness at the ending of the musical phrase (R4A, P4A, I4A). When everyone clapped him, he screamed with excitement and delight. However, his performances on this task fluctuated in focus in the music lesson.

The teacher asked another child to distinguish and make a connection between the rhythmic notation (♩ ♩ ♫ ♩) and chanting 'ta ta ti ti ta' by offering her three different rhythmic notations from which to choose. When the teacher read out the correct rhythmic notation card while tapping the rhythm with a stick, J joined the activity with his vocalisation and imitated the last word 'ta' with more consistency (R3D, I3C). In the 'goodbye song', when the teacher sang 'goodbye' to J, he responded 'goodbye' back to

the teacher (R3A, P3A). J also interacted independently with his peers by saying 'goodbye' within the structure of the song followed by the teacher's instruction (R4A, P3C, I4A).

The following table summarises the coding of J's musical engagement moments in week 3:

Table 8.3 The raw data table of J in week 3

		Domain Categorisation			Element Matching					
					R		P		I	
WK	OBS	R	P	I	Score	Element	Score	Element	Score	Element
03	J001	1	1	1	4	A	4	A	4	B
03	J002	1		1	3	A			2	D
03	J003	1		1	3	A			2	C
03	J004	1		1	3	A			3	A
03	J005	1	1	1	2	B	2	B	2	A
03	J006	1	1	1	3	C	3	A	3	C
03	J007	1	1	1	4	A	4	A	4	A
03	J008	1		1	3	D			3	C
03	J009	1	1		3	A	3	A		
03	J010	1	1	1	4	A	3	C	4	A

The following stack profile (see Chapter 6 for how the stack profile is created) summarises the musical development mapping in week 3 of J. His musical behaviours ranged from level 2 to 4 in each of the reactive, proactive and interactive domains. The modes for the reactive and proactive domains were at level 3 and the interactive domain was at level 4 respectively (demonstrated by the darker shading for these codings).

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
03	R1		0	P1		0	I1		0
03	R2	1	10	P2	1	17	I2	2	22
03	R3	6	60	P3	3	50	I3	3	33
03	R4	3	30	P4	2	33	I4	4	44
03	R5		0	P5		0	I5		0
03	R6		0	P6		0	I6		0
03	Total	10	100	Total	6	100	Total	9	100

Fig. 8.1 Stack profile of J in week 3

Week 12

In week 12 (approximately the mid point of the reported observation period), the teacher was preparing the children to practise the animal song and planned to present the song in the school assembly. J had a 'long' conversation with the teacher by answering 'yes' or 'no'. He understood the questions well and was clear about the answers that demonstrated a good memory of last week's task (e.g. presented with a dog and producing a 'bow wow wow' sound) (audio extract 1.1 in Appendix J) (R4A, P4A). He followed the teacher's instructions well when the teacher asked J to press the switch to see if the switch was working. J also pressed the switch appropriately when it was his turn (R4D, P4D, I4D, see extract 1.2 in Appendix J) in turn taking with another child in the animal's song.

Later, J pressed the switch with good timing within the prominent musical structure even though the song was becoming more complex with an increased length (up to six animals in turn taking with other children involved several times) (R5B, P5A, I5A). When the teacher asked the children to choose an instrument to represent their animals, J chose a shaker to represent the dog in the song. For instrumental playing, J found it hard to play because of his physical difficulties and needed TA's help. When it was J's turn to play the shaker, he sometimes vocalised to show his awareness (R5A, P1B, I4D). The researcher felt that he recognised the turn taking and the structural features of the

song, but his responses were constrained due to his physical disabilities and communication difficulties.

In a rhythmic notation work (see audio extract 1.3 in Appendix J), the teacher held J's hand to point a rhythmic notation pattern on 'ti ti ta ta sh' (♫ ♩ ♩ 𝄽) and J participated in chanting 'ta' and 'sh' (R4A, P3A, I3C). For a small team work, J's group was chanting the rhythmic pattern on 'ta ta ti ti ta' (♩ ♩ ♫ ♩) while turn taking with another group for 'ti ti ti ti ta ta' (♫ ♫ ♩ ♩) . J chanted the first and last word 'ta' (♩) clearly while reading the card simultaneously with the teacher and turn taking with another group (R4B, P4B, I4B).

The teacher then changed to different rhythmic patterns for the two groups. J's group was chanting 'ti ti sh ti ti sh' (♫ 𝄽 ♫ 𝄽) and another group was chanting 'ta ta ta ta' (♩ ♩ ♩ ♩). This time J seemed a little bit muddled and he said 'ta' in the place of 'sh', but soon he seemed to realise that the symbol should be 'sh'. J vocalised 'ta' when it was another team's turn and he also did 'sh' when it was his team's turn signalled by the TA. J engaged well and concentrated throughout the activity (R4D, P4D, I4D).

From time to time, J would put his right thumb in his mouth for comfort when the teacher was talking or working with other children. In this music lesson, J exhibited a clear choice by saying, 'switch', 'no', 'yeah' and 'change'. When the teacher played the melody of the 'little bird' on the piano, J vocalised with excitement and a loud voice. He attended to the whole piece of music and recognised the melody of the song (R5A, P4D, I5A). When the teacher started singing the song 'little bird' with a piano accompaniment, J vocalised in-tune with the teacher's singing, enthusiastically and expressively, with a

wide opened mouth and bright eyes throughout the whole of the song (R5A, P5A, I5A).

When the teacher asked a child to sing the notes of the song 'little bird' with him, J laughed and also vocalised along with their singing (R4B, P4A, I4B). When the teacher asked J to sing the notes of the song, J said 'yeah' and vocalised with the teacher (R4B, P3D, I4A). The teacher recorded the singing on the switch and asked J to do the switching. J vocalised actively throughout the singing on the switch, but he needed partial prompt on pressing the switches (R5A, P5A, I5A). J showed great enthusiasm for reviewing the musical materials and tasks that he did several weeks' ago. The following table summarises the coding of J's musical engagement moments in week 12:

Table 8.4 The raw data table of J in week 12

		Domain Categorisation			Element Matching					
					R		P		I	
12	J097	1	1		4	A	3	D		
12	J098	1	1		4	A	4	A		
12	J099	1	1	1	4	D	4	D	4	D
12	J100	1	1	1	4	D	4	D	4	D
12	J101	1	1	1	5	B	5	A	5	A
12	J102	1	1	1	5	B	5	A	5	A
12	J103	1	1	1	5	B	5	A	5	A
12	J104		1				3	A		
12	J105	1	1		3	D	3	D		
12	J106	1	1	1	5	A	1	B	4	D
12	J107	1	1	1	3	D	2	C	2	B
12	J108	1	1	1	4	A	3	A	3	C
12	J109		1				3	D		
12	J110	1	1	1	4	B	4	B	4	B
12	J111	1	1	1	4	C	4	A	4	D
12	J112	1	1	1	4	D	4	D	4	D
12	J113	1	1	1	5	A	4	D	5	A
12	J114	1	1	1	5	A	5	A	5	A
12	J115	1	1	1	4	B	4	A	4	B
12	J116	1	1	1	4	B	3	D	4	A
12	J117		1				3	D		
12	J118	1	1	1	5	A	5	A	5	A

The following stack profile summarises J's musical behaviours mapping in week 12. J's musical behaviours ranged from level 3 to 5 in the reactive domain, level 1 to 5 in the proactive and level 2 to 5 in the interactive domain. The modes for the reactive, proactive, and interactive domains were located at level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
12	R1		0	P1	1	5	I1		0
12	R2		0	P2	1	5	I2	1	6
12	R3	2	11	P3	7	32	I3	1	6
12	R4	10	53	P4	8	36	I4	8	50
12	R5	7	37	P5	5	23	I5	6	38
12	R6		0	P6		0	I6		0
12	Total	19	100	Total	22	100	Total	16	100

Fig. 8.2 Stack profile of J in week 12

Week 21

In week 21, the orchestral musicians came in for a rehearsal with the children of the two songs for their planned performance in three days' time. J opened his mouth and lifted up his hands when he listened to the live music playing. The teacher held J's hands and moved to the music. J had big smiles on his face and appeared to be very happy (R4B).

The music teacher handed the children some shakers and small drums for them to play along with the live music. J vocalised shortly when the teacher held his hand to play a shaker and he enjoyed it very much with a big open mouth (R4B, P1B). The teacher then gave J a big drum and helped him to beat on the drum according to the live music's tempo. J had expressive vocalisation towards the ensemble playing (R4B, P1B). J's left hand was relaxed down on the tray and his face lit up.

When the musicians started to play one of the songs and the researcher sang quietly to a child who sat next to J, J recognised the song immediately and turned to the researcher

with his wide open mouth and big smile (R4B). In practice, the teacher asked J to sing the musical phrase 'bobble bobble sugar cake' and J vocalised in response (R4D, I4D).

In a rehearsal of the songs, J was presented with the musical phrase 'spice and coconut' and vocalised in time when it was his turn and opened his mouth wide – with evident full engagement (R5B, P5A, I4D). J listened very well with good concentration throughout the whole song and vocalised the very last word 'lot' in good timing with the teacher's singing (R5A, P5A, I5A). When the teacher placed the switch in front of J, he pressed the switch in turn taking with other children (R5A, P5A, I4D). When the teacher moved away, J's eye followed the teacher's direction. Later, the music teacher went up to J and held his hands. J vocalised a short pattern of musical sounds in turn taking with others in the song 'sugar cake' (R5B, P5A, I4D). For detailed data analyses on the song 'sugar cake', see extracts 2.1 and 2.2 in section 8.4.

On the second song 'hop along popcorn', J started vocalising while he heard the teacher singing: 'in out, up down, catch me if you can'. J was very excited and vocalised with great enjoyment. He sang at the very last word 'can' clearly and in good timing (R5C, P5A, I5A). J's singing got more confident when the TA sang the music with him. He turned to the TA with a louder voice at the end of the song. He was smiling and listened well to the music (R5B, P5A, I5A). Later, J started to vocalise expressively with another child and the teacher's singing in good voice (R5A, P5B, I5B). (For a detailed example on the song 'hop along popcorn', see video extract 2.3 in section 8.4).

J participated in singing and vocalising the two songs along with the teacher's singing. His vocalisation was sometimes in time and in tune with the music. Because of his visual impairment, he might not always know who it was sitting next to him when it was his turn to press the switch in the group performance. The TA needed to whisper in

his ear and adjust the switch on his left hand side that J would be in a better position to press the switch. However, this did not always work and the TA would take the switch to touch J's hand if they waited too long.

In listening to live music played by the orchestra musicians, J put his left hand thumb into his mouth and then closed his eyes, seemingly in reflection to the mood of the music. When the music finished, J opened his eyes and looked in the musician's direction (R4D).

In an action activity, the teacher interacted with J using a poem chanting: 'Bananas, bananas, Clap! Clap! Clap! Bananas, bananas, Flap! Flap! Flap! Bananas, bananas, Click! Click! Click! Bananas, bananas, Flick! Flick! Flick! Bananas, bananas, Bump! Bump! Bump! Bananas, bananas, Jump! Jump! Jump!'. J was asked to press the switch to say 'bananas, bananas' while taking turns with the teacher and teaching assistants who needed to do the actions. J had a smile and pressed the switch in time on the first run (R5B, P5A, I4D).

When the music technician came into the hall, J seemed to be distracted and lost his concentration. He smiled, but did not press the switch although everyone was waiting for him. J opened his mouth and eyes when teacher called out his name to encourage him to concentrate and keep going. The TA then moved the switch closer to J and he then pressed the switch till the end of the poem (R4D, P4A, I4D). Staff clapped in appreciation for J and he had big smiles. Later, J laughed and found the poem and actions funny throughout the whole activity. He seemed to recognise the distinctive groups of chanting patterns, the structure of the activity and the causal relationships between other people's action and the switch sound that he pressed (R4A). In a similar activity, J took turns with another child who was also on the switch to perform the poem

(R4D, P4D, I4D).

In practising the song 'sugar cake', J waited for a long time before pressing the switch in order to sing his musical phrase 'sugar cake, sugar cake' when turn taking with others (R4B, P4A, I4C). In rehearsal, J pressed the switch better in time with turn taking, attending to the whole song (R5A, P5A, I4D). After the song 'sugar cake', the performance went straight into the song 'pop along popcorn'. J vocalised towards the music 'pop along' as soon as he heard the musicians play the first few notes of the melody (R4D, P4A, I4D). To finish the performance, the music went back to 'sugar cake' again. J pressed the switch in turn taking to sing the musical phrase when it was his turn in time (R5A, P5A, I4D).

In the last rehearsal, J pressed the switch on the song 'sugar cake' with delayed response when given the time in turn taking (R5A, P4B, I4D). The improvisation part went very well (R5C, P5B, I5C) but J had much delayed his response in pressing the switch when it was his turn to go back to switch the song in turn taking (R4B, P4A, I4D). Then the music went straight into 'pop along popcorn' and J's musical phrase was 'up, down'. He pressed the switch in time with good turn taking (R5A, P5A, I4D). The last part of the performance went back to the song 'sugar cake' in turn taking and J performed well in the task this time (R5C, P5A, I4D).

The following table summarises the coding of J's musical engagement moments in week 21:

Table 8.5 The raw data table of J in week 21

		Domain Categorisation			Element Matching					
					R		P		I	
21	J187	1			4	B				
21	J188	1	1		4	B	1	B		
21	J189	1	1		4	B	1	B		
21	J190	1	1		4	B	1	B		
21	J191	1			4	B				
21	J192	1		1	4	D			4	D
21	J193	1	1	1	5	B	5	A	4	D
21	J194	1	1	1	5	A	5	A	5	A
21	J195	1	1	1	5	A	5	A	4	D
21	J196	1	1	1	5	B	5	A	4	D
21	J197	1	1	1	5	C	5	A	5	A
21	J198	1	1	1	5	B	5	A	5	A
21	J199	1	1	1	5	A	5	B	5	B
21	J200	1			4	D				
21	J201	1	1	1	5	B	5	A	4	D
21	J202	1	1	1	4	D	4	A	4	D
21	J203	1			4	A				
21	J204	1	1	1	4	D	4	D	4	D
21	J205	1	1	1	4	B	4	A	4	C
21	J206	1	1	1	5	A	5	A	4	D
21	J207	1	1	1	4	D	4	A	4	D
21	J208	1	1	1	5	A	5	A	4	D
21	J209	1	1	1	5	A	4	B	4	D
21	J210	1	1	1	5	C	5	B	5	C
21	J211	1	1	1	4	B	4	A	4	D
21	J212	1	1	1	5	A	5	A	4	D
21	J213	1	1	1	5	C	5	A	4	D

The following stack profile summarises J's musical development mapping in week 21. His musical behaviours ranged from level 4 to 5 in the reactive domain, levels 1 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 5 and the interactive domain at

level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
21	R1		0	P1	3	14	I1		0
21	R2		0	P2		0	I2		0
21	R3		0	P3		0	I3		0
21	R4	13	48	P4	6	27	I4	15	75
21	R5	14	52	P5	13	59	I5	5	25
21	R6		0	P6		0	I6		0
21	Total	27	100	Total	22	100	Total	20	100

Fig. 8.3 Stack profile of J in week 21

8.4 Video sample extracts' coding and comments of J

To illustrate further and give a detailed snapshot regarding what was actually happening in the music lessons and the interaction between the teacher, the staff, the child and his peers, the following section provides example video extracts and their analyses. For the audio extracts example, see Appendix J. These examples of the detailed transcription, coding, and comments of J's musical behaviours and development were taken from week 21. These extracts last from a few seconds to roughly three minutes.

8.4.1 Video data analyses of J in week 21

The context of this lesson was that the children were going to perform in three days time with a well-known orchestra in the Barbican Centre. A viola player and a cellist from the orchestra came into the class and performed the rehearsals with the children. A music technician also supported the class with the required music technologies for the children's performances. The children took turns to sing each musical phrase of the song 'sugar cake' or sang the whole song by themselves (see extracts 2.1 and 2.2 in Table 8.6). The children also rehearsed the second song 'hop along popcorn' (see extract 2.3 in Table 8.6).

Table 8.6 Detailed video transcription extracts in week 21 (phase two) of J

Sol rating	Evidence (extract 2.1, week 21)	Comment
J: R4D, I4D	Musicians play the melody (5 6 5 3 5 3 | 1 2 1 6 5 - | 5 6 5 6 1 2 3 | 5 6 5 3 1 - |) on their instruments K: sugar cake, sugar cake, spice and coconut (5 6 5 3 5 3 | 1 2 1 6 5 -) U presses on the switch to sing sugar cake sugar cake (5 6 5 3 5 3) K: bobbling in a pot (1 2 1 6 5 -) T: 'J, can you sing bobble bobble sugar cake (5 6 5 6 1 2 3)'? J: Bobble (5 5 -) Boo~Ahh (5 -) T: 'Oh, beautiful singing. Well done.	J vocalised when it was his turn to sing a musical phrase. He opened his mouth wide open with full engagement and good eye contact with the teacher (R4D, I4D).
Sol rating	Evidence (extract 2.2, week 21)	Comment
J: R5A, P5A, I5A	T: (sings to P and wants P to join in singing) sugar cake, sugar cake, spice and coconut, sweet and sticky, brown and gooey, I could eat the lot (5 6 5 3 5 3 | 1 2 1 6 5 - | 5 6 1 6 1 2 3 5 | 6 5 6 5 1 - ‖. K sings simultaneously with the teacher for the whole song. J (sings simultaneously with K and the teacher): Lot (1 -)! T: 'Wow, fantastic!'	J listened very well with good concentration and attended to the whole song. He vocalised and sang the very last word 'lot' with good timing, clear pronunciation and loud volume

		with K and the teacher's singing (R5A, P5A, I5A).
Sol rating	Evidence (extract 2.3, week 21)	Comment
J: R5C, P5A, I5A J: R5B, P5A, I5A	T: 'ready? I am a hop along, pop along, popcorn in the pen, in out, up down, catch me if you can 3 3 | 5 3 5 6 3 6 | 5 5 3 5 i – | i 5 i 5 | 3 5 3 2 1 – ‖. J (sings simultaneously with the teacher with fluctuate vocal sounds): A~ (1 –)...Can (1 –)! Musicians repeat the melody. K (sings simultaneously with the musicians' playing): popcorn in the pen, in out, up down, catch me if you can 5 5 3 5 i – | i 5 i 5 | 3 5 3 2 1 – ‖ J (vocalises with K's singing and musicians' playing): A~ (1 –)... in out (i 5)...can (1 –). A~ (1 –) T: 'K, are you going to sing the song for me as well? Because you bring in that southern American flavour to it. K nods several times. T: 'ready? Off you go (5 5 5). I am a hop along, pop along, popcorn in the pen, in out, up down, catch me if you can ‖: 3 3 | 5 3 5 6 3 6 | 5 5 3 5 i – | i 5 i 5 | 3 5 3 2 1 – :‖. K (sings simultaneously with the teacher but he concentrates on clapping the tempo more than singing): hop along (5 3 5), pop along (6 3 6)...in out (i 5), up down (i 5)...in out (i 5), up down (i 5). J (vocalises and sings simultaneously with the teacher): A~	J started to vocalise when he heard the teacher's singing on 'in out, up down, catch me if you can'. J was very excited and vocalised the musical motifs with great enjoyment (R5C, P5A, I5A). J sang at the very last word 'can' clearly, loudly and in good timing. J's singing got more confident when TA sang the music with him. He turned to the TA and his mouth was wide open with full engagement in his vocalisation (R5B, P5A, I5A). During the activity, J smiled and listened well to the music that the musicians were playing. He

J: R5A, P5B, I5B	(1 –) ... A~ (1 –)...Can (1 –)...A~ (1 –) in out (i 5), up down (i 5)...can (1 –). Everyone claps the children and one TA taps on J's tray to cause the vibration for him to know about the clapping.	could distinguish the melodic lines and knew when to sing the specific words. J started to vocalise with K and the musicians' playing (R5A, P5B, I5B).

The main features of these extracts showed that J attended to two whole pieces of music and developed his preferences by singing the last words of some musical phrases, as well as being vocalised throughout the songs. His singing and vocalisation were also nearly in-tune (although the pitch fluctuated) and in time with the teacher's singing, especially towards the end.

8.5 Weekly musical development analyses of J

Apart from the detailed coding and comments for the sample weeks above, which were provided in sections 8.3 and 8.4, this section provides longitudinal data and time series analyses of J's musical development over eight months. Later, section 8.6 will provide another perspective for looking into J's musical development through different phases during the observational period.

8.5.1 Weekly stack profile analyses

The following analyses are arranged along the reactive, proactive and interactive domains. Within each domain, the analyses are mainly concerned with the range, the relative concentration and the distribution pattern of J's musical development levels. The stack profile analyses are based on the concept of relative frequency distribution.

The procedure for producing these stack profiles can be found in Chapter 6.

Reactive Domain

Fig. 8.4 shows J's musical behaviours in the reactive domain over eight months. The range was from R1 – R5 in phase one and it further converged and narrowed down towards a higher level of R3 – R5 in phase two. For the relative concentration of J's musical behaviours level, it was mostly located between R3 and R5 in phase one with R4 for four weeks and R5 for two weeks, and then concentrated towards R5 in phase two, with R5 for six weeks. In phase one, the musical behaviours were more variable in developmental levels, but showed greater consistency in phase two.

Overall, the distribution pattern over eight months showed that J's musical behaviours in the reactive domain occurred mostly in R4 in phase one. In phase two, J's musical behaviours concentrated in R5 most of the time, except for week 15.

Phase		1								2							
WK		03	05	06	07	10	11	12	14	15	16	17	18	19	20	21	22
R	R1	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0
	R2	10	6	0	0	6	16	0	0	0	0	0	0	0	0	0	0
	R3	60	18	9	25	6	37	11	20	56	25	0	0	0	0	0	50
	R4	30	76	64	50	35	21	53	20	38	25	20	17	9	10	48	17
	R5	0	0	27	25	53	21	37	60	6	50	80	83	91	90	52	33
	R6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 8.4 Stack profile of J in the reactive domain over eight months

Proactive Domain

Fig. 8.5 shows that J's musical behaviours in the proactive domain ranged from P1 – P5 in phase one and it stayed in the same range in phase two. Considering the relative concentration of proactive behaviours, these were located around P3 and P4 in most of the weeks in phase one with P3 for six weeks and P4 for three weeks. In phase two, it moved towards higher levels of P5 for six weeks.

Overall, the distribution pattern over eight months showed that J's musical behaviours in the proactive domain occurred mostly between P3 and P5 in phase one and it apparently increased its relative occurrences to P5 in phase two.

Phase		1								2							
WK		03	05	06	07	10	11	12	14	15	16	17	18	19	20	21	22
P	P1	0	0	0	0	0	12	5	0	40	0	0	0	0	9	14	25
	P2	17	11	9	11	0	24	5	0	5	0	0	0	0	0	0	0
	P3	50	44	36	33	21	32	32	50	20	40	38	0	0	0	0	25
	P4	33	44	27	33	37	16	36	0	30	20	13	0	30	27	27	25
	P5	0	0	27	22	42	16	23	50	5	40	50	100	70	64	59	25
	P6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 8.5 Stack profile of J in the proactive domain over eight months

Interactive Domain

Fig. 8.6 shows that J's observed musical behaviours in the interactive domain ranged from I2 – I5 in phase one and it stayed the same in phase two. For the relative concentration of J's interactive musical development levels, it mostly located at I4 for seven weeks. In phase two, the concentration still mostly located at I4, especially towards the last 5 weeks, but since the range became much narrower, the concentration at I4 was much stronger.

Overall, the distribution pattern over eight months showed that J's musical behaviours in the interactive domain were more scattered in phase one, covering between I2 and I5. The musical development moved to higher levels towards the end of phase two, and stayed more consistently at I4 and I5.

Phase		1								2							
WK		03	05	06	07	10	11	12	14	15	16	17	18	19	20	21	22
I	I1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	I2	22	18	43	67	17	33	6	0	53	33	0	0	0	0	0	33
	I3	33	18	0	0	0	13	6	0	7	0	0	0	0	0	0	0
	I4	44	64	43	0	72	40	50	100	40	33	75	100	64	67	75	33
	I5	0	0	14	33	11	13	38	0	0	33	25	0	36	33	25	33
	I6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 8.6 Stack profile of J in the interactive domain over eight months

Overall summary from the weekly stack profile analyses

Even though the distribution pattern in each domain was somehow different, both the range and concentration of musical development levels moved gradually towards more complex musical behaviours, when considering the mode movement for the reactive and proactive domains and the increased relative concentration for the interactive domain over eight months. Although J had physical disabilities, the distribution pattern of the musical behaviours levels still showed a trend of moving towards more complex musical behaviours, especially in phase two when there was a richer musical experience being offered by the team of musicians as well as the music teacher. The patterns of behaviours also became more consistent across all domains in phase two.

8.5.2 Weekly weighted average level analyses

The above weekly stack profile analyses are mainly based on the concept of relative frequency distribution across the three *SoI* domains. If we are willing to make a further working assumption that the conceptual distance between different *SoI* levels, within each domain, is roughly the same, then additional analytical perspectives can be provided through weekly weighted average level analyses.

This weekly level analyses can be considered as being supplementary to the stack profile analyses in 8.5.1. By combining these two types of analyses, it is hoped that the

reader would be able to have a more comprehensive understanding of J's musical behaviours and development for the observational period.

Based on the data from the frequency distribution table for each week (see Chapter 6), we can use the concept of weighted average to produce the weekly levels, as in Table 8.7. The weekly weighted average level can be calculated by taking the average across each level, with the corresponding relative frequency as the weight. Apart from the weekly level for individual domains, an overall level for each week can also be produced by taking the simple average across the three domains. These levels provide a single and convenient numerical summary for each week, both concerning the three individual domains and the overall musical development level.

Table 8.7 Weekly weighted average levels of J

Weekly Level				
WK	R	P	I	Overall
03	3.2	3.2	3.0	3.1
05	3.7	3.3	3.5	3.5
06	4.2	3.7	3.3	3.7
07	4.0	3.7	3.0	3.6
10	4.4	4.2	3.8	4.1
11	3.4	3.0	3.3	3.2
12	4.3	3.7	4.2	4.0
14	4.4	4.0	4.0	4.1
15	3.5	2.6	2.9	3.0
16	4.3	4.0	3.7	4.0
17	4.8	4.1	4.3	4.4
18	4.8	5.0	4.0	4.6
19	4.9	4.7	4.4	4.7
20	4.9	4.4	4.3	4.5
21	4.5	4.2	4.3	4.3
22	3.8	3.3	3.7	3.6

To further facilitate the analyses, the following figures used the data from Table 8.7 to show J's musical development trajectories over eight months, both along the different

domains and for the overall level. Each point in the figures refers to the weekly average level.

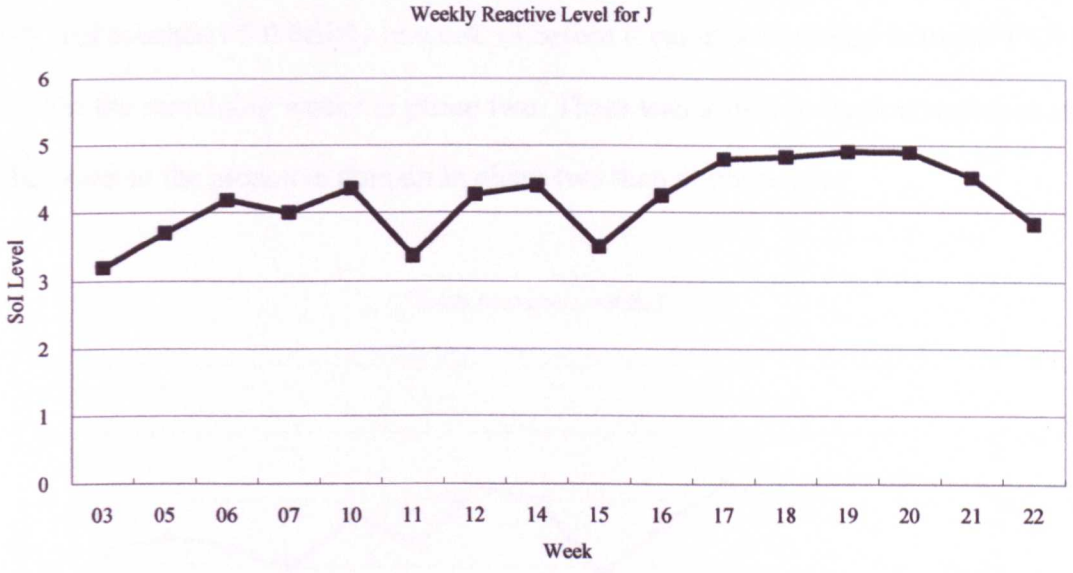


Fig. 8.7 Weekly weighted average levels of J in the reactive domain

Fig. 8.7 shows that J's musical behaviours in the reactive domain moved between R3 and R5 over eight months. It had some variations in phase one. In phase two from week 15, it showed a gradual movement towards more complex musical behaviours and became more stable for a period of time.

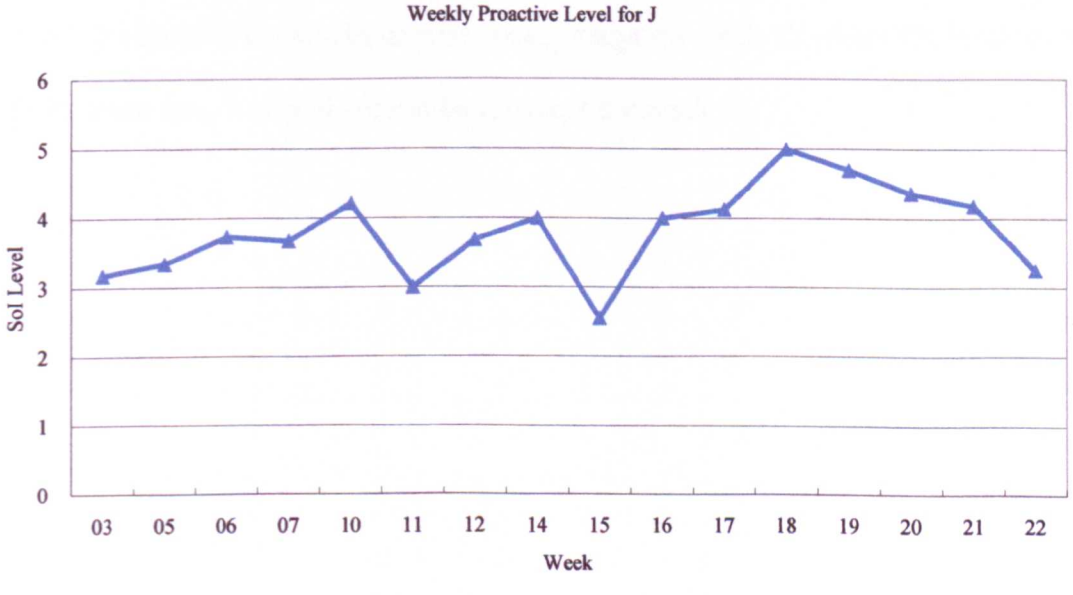


Fig. 8.8 Weekly weighted average levels of J in the proactive domain

Fig. 8.8 shows J's musical behaviours in the proactive domain. It remained between P3.0 and P4.0 for phase one, except in week 10. When phase two began in week 15, the level dropped to a rather low level between P2.0 and P3.0, but it soon climbed to exceed P4.0, and touched P5.0 briefly in week 18 before it came back to stay between P4.0 and P5.0 for the remaining weeks in phase two. There was a shift to more complex musical behaviours in the proactive domain in phase two than in phase one.

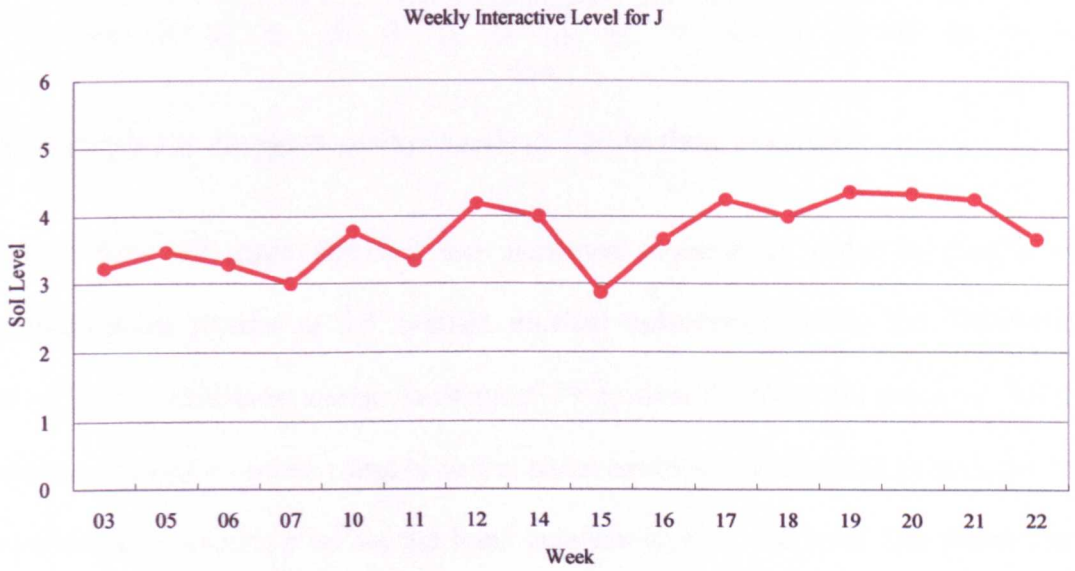


Fig. 8.9 Weekly weighted average levels of J in the interactive domain

Fig. 8.9 shows that J's musical behaviours in the interactive domain stayed between I3.0 and I4.0 for most of the weeks in phase one, except for week 12 where the level reached I4.2. In phase two, it stayed around I4.0, except for week 15.

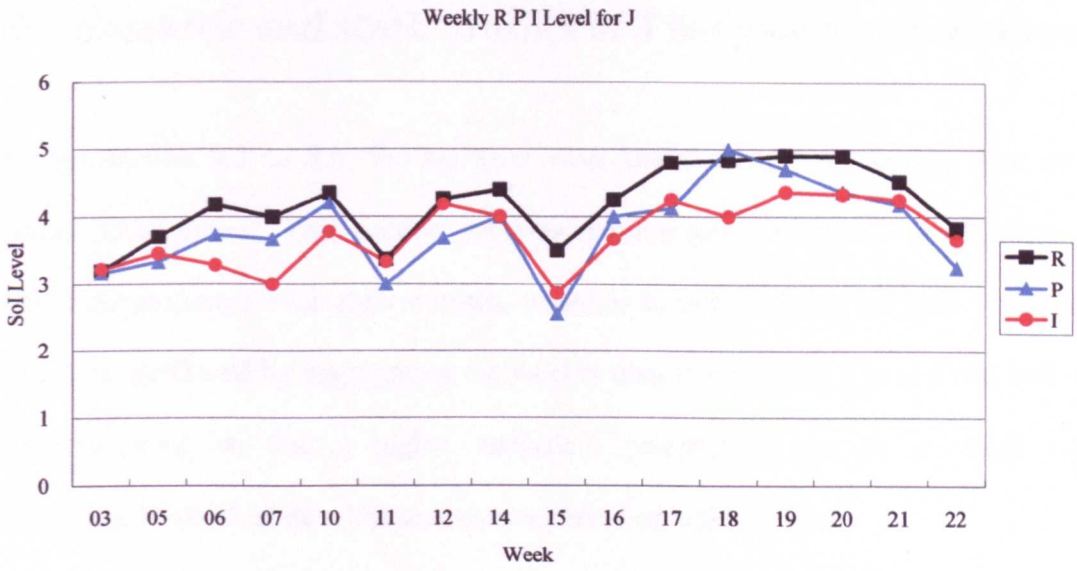


Fig. 8.10 Weekly weighted average levels of J in the three domains

In Fig. 8.10, all three domains are presented together in order to give a more comprehensive picture of J's average musical behaviours during the observational period. From this figure, certain patterns of J's musical development emerged. All three domains seemed to move roughly in the same manner. The musical behaviours in all three domains remained within the band between level 3 and level 5 in phase one. In phase two, these levels all started lower, but then moved up and stayed within the band between level 4 and level 5 from week 17 until the end of phase two. Then they all dropped back below 4 after phase two in the final week (week 22), which may due to the ending of the special music project 'Music Makers Sing!'. It can be seen that J's musical behaviours and development levels moved gradually towards a more complex position across all domains from phase one to phase two. The analytical results in this section give a similar picture to what has been provided through the stack profile analyses in 8.5.1, and serve as a supplementary analyses to further enhance the understanding of J's musical behaviours and development over a period of eight months.

8.6 Concentric and stack profiles of J for phases one and two

Through section 8.3 to 8.5, the analyses were based mainly on weekly data of J's musical development. This section presents another perspective for looking into J's musical development over eight months, which is based on phase analyses. The phase profiles are produced by aggregating the weekly data from phases one and two into two analytical units, so that a higher analytical perspective can be provided when considering J's musical development over a period of eight months.

As a starting point, Table 8.8 is a summative relative frequency distribution table, which aggregated all weekly data within each phase across the three domains. This procedure raised the analytical level from weekly to phase level by aggregating all the weeks into phase one and phase two, and the number of musical engagement events increased substantially.

Table 8.8 Relative frequency distribution table of J in phases one and two

Phase Profile by Relative Frequency (%)								
Phase one								
Domain	Freq	%	Domain	Freq	%	Domain	Freq	%
R1	1	1	P1	4	3	I1	0	0
R2	6	6	P2	12	10	I2	18	22
R3	23	22	P3	40	34	I3	8	10
R4	48	45	P4	35	30	I4	44	54
R5	28	26	P5	25	22	I5	12	15
R6	0	0	P6	0	0	I6	0	0
Total	106	100	Total	116	100	Total	82	100
Phase two								
Domain	Freq	%	Domain	Freq	%	Domain	Freq	%
R1	0	0	P1	12	15	I1	0	0
R2	0	0	P2	1	1	I2	9	14
R3	10	13	P3	9	11	I3	1	2
R4	24	30	P4	20	25	I4	42	64
R5	45	57	P5	39	48	I5	14	21
R6	0	0	P6	0	0	I6	0	0
Total	79	100	Total	81	100	Total	66	100

Phase one

Table 8.8 shows that J's musical behaviours range was from R1 to R5 in the reactive domain in phase one. The concentration in the reactive domain located at R4, corresponds to 'recognises and responds to distinctive groups of musical sounds and the ways they relate' in the *SoI* framework. R3 and R5 occurred less frequently, whereas R1 and R2 musical behaviours occurred only a few times. Overall, in the reactive domain, most observations occurred at R3 and R4, which accounted for 67% of the total number of occurrence, with the most observed behaviours appearing to be concentrated on R4.

In the proactive domain, J's musical behaviours ranged from P1 to P5. The concentration located at P3 and P4, which corresponds to 'intentionally makes patterns in sound through repetition or regularity' and 'creates or re-creates short groups of musical sounds and links them coherently' in the *SoI* framework, whereas P1 and P2

occurred only rarely. The frequency of occurrence of P5 is roughly between the frequency of P3 and P2. Overall, most observations concentrated at P3 and P4, which accounted for 64% of the total number of occurrence.

In the interactive domain, J's musical behaviours ranged from I2 to I5. The concentration located at I4, which corresponded to 'engages in dialogues using distinctive groups of musical sounds' in the *SoI* framework. Compared with I4, all the remaining levels only occurred moderately. Overall, the pattern in the interactive domain apparently had greatest concentration at I4, which already accounted for more than 50% of the total number of occurrence.

Based on the assessment procedure in Chapter 6, we can use a phase concentric profile (Fig. 8.11) to summarise the analyses above. This concentric profile illustrates J's musical development mapping in phase one.

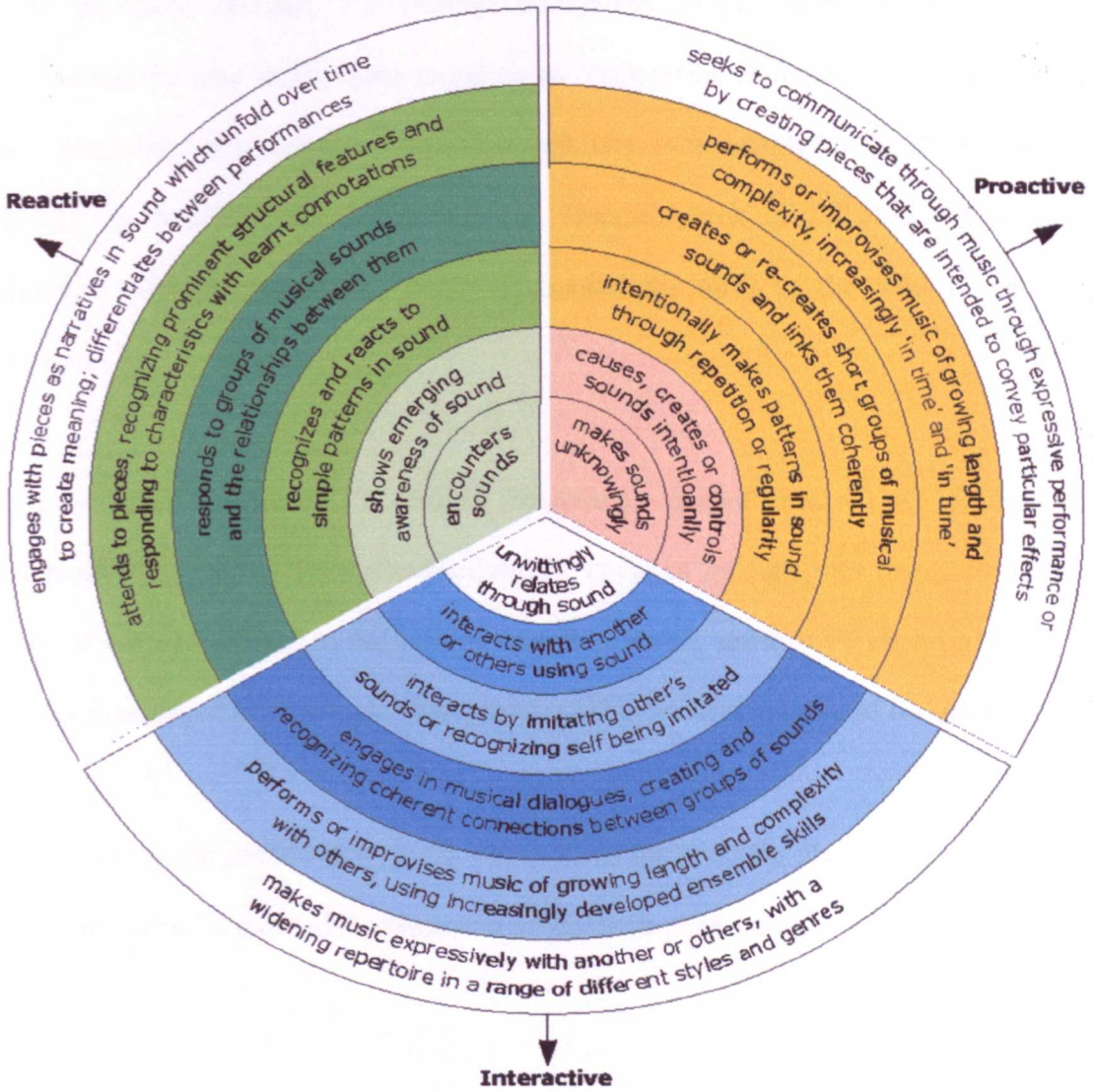


Fig. 8.11 Concentric profile of J in phase one

Phase two

From Table 8.8, J's musical behaviours in the reactive domain ranged from R3 to R5, and the concentration located at R5, corresponding to 'attends to whole pieces: recognises prominent structural features; responds to general characteristics; develops preferences' in the *SoI* framework. Compared with R5, R4 occurred relatively less frequently, and R3 occurred relatively rarely. Overall, for the reactive domain, most of J's observed musical behaviours occurred at R5 which accounted for 57% of the total number of occurrence.

In the proactive domain, J's musical behaviours ranged from P1 to P5. The concentration located at P5, corresponding to '(re)creates short and simple pieces of music, potentially of growing length and complexity; increasingly "in time" and (where relevant) "in tune" in the *SoI* framework. Overall, most of J's observed musical behaviours concentrated at P5, which accounted for 48% of the total number of occurrence.

In the interactive domain, J's musical behaviours ranged from I2 to I5, and the concentration located at I4, corresponding to 'engages in dialogues using distinctive groups of musical sounds' in the *SoI* framework. Overall, most of J's observed musical behaviours occurred at I4, which accounted for 64% the total number of occurrence.

A phase concentric profile (Fig. 8.12) summarises the analyses above. This concentric profile illustrates J's musical development mapping in phase two.

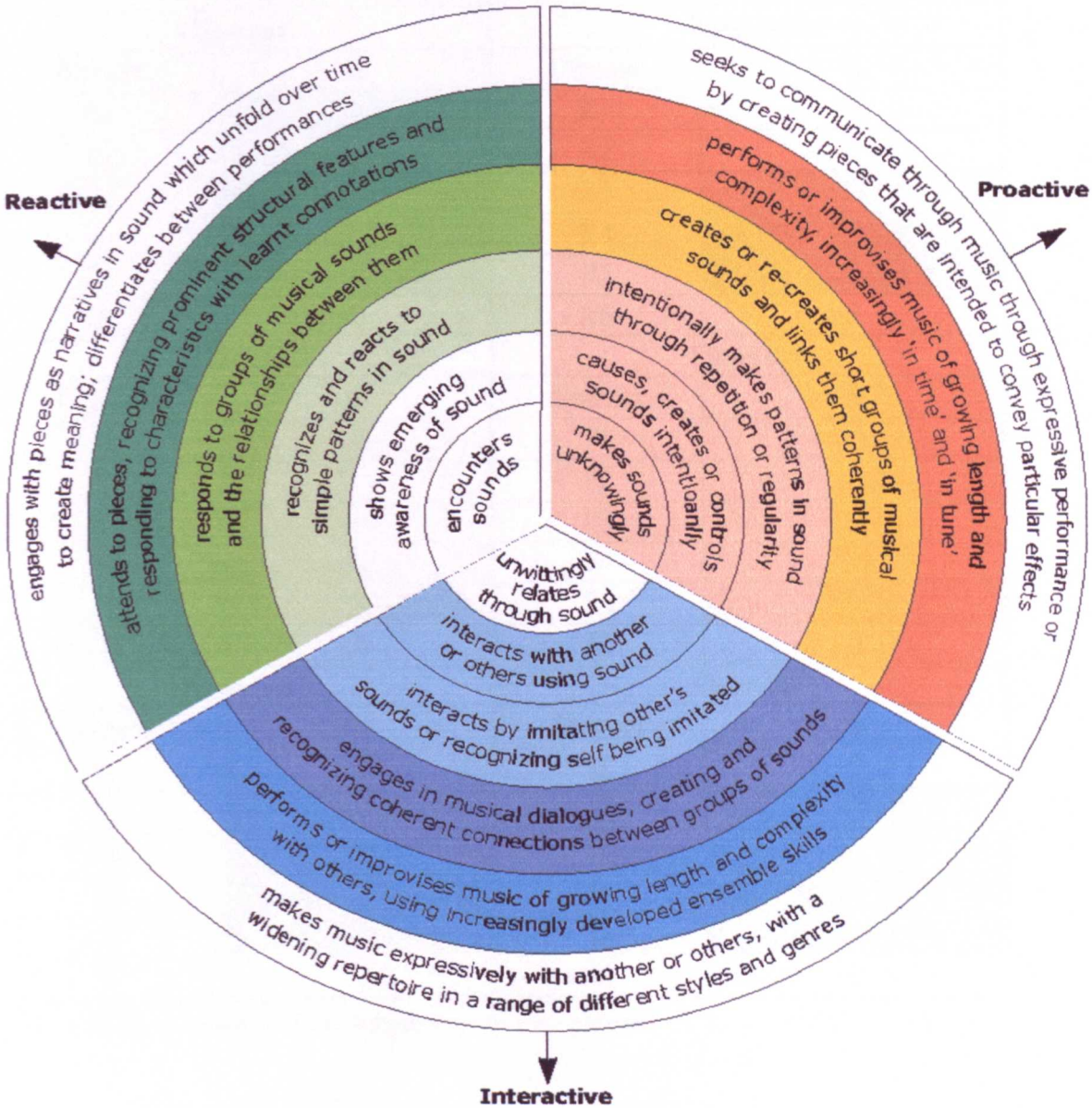


Fig. 8.12 Concentric profile of J in phase two

Phase comparison and analyses

Fig. 8.13 is provided to further investigate the musical development changes between phase one and phase two. It is a large phase stack profile which includes both phase one and phase two of J's musical development mapping. By putting two phase stack profiles together, it offers an easier comparison of the musical development changes between these two phases. Fig. 8.13 also serves as a further supplementary chart towards the two concentric profiles (Fig. 8.11 and 8.12) provided above.

Phase Profile Chart			
Phase one		Phase two	
Domain	%	Domain	%
R1	1	R1	0
R2	6	R2	0
R3	22	R3	13
R4	45	R4	30
R5	26	R5	57
R6	0	R6	0
Phase one		Phase two	
Domain	%	Domain	%
P1	3	P1	15
P2	10	P2	1
P3	34	P3	11
P4	30	P4	25
P5	22	P5	48
P6	0	P6	0
Phase one		Phase two	
Domain	%	Domain	%
I1	0	I1	0
I2	22	I2	14
I3	10	I3	2
I4	54	I4	64
I5	15	I5	21
I6	0	I6	0

Fig. 8.13 Stack profiles of J in comparison of two phases

In comparing J's musical development in phases one and two through Fig.8.13, there were gradual changes across all three domains.

In the reactive domain, not only did the range converge from R1-R5 in phase one to R3-R5 in phase two, the concentration also moved from R4 in phase one to R5 in phase two. Furthermore, the combined concentration of R4 and R5 increased from 71% in phase one to 87% in phase two.

In the proactive domain, the range stayed the same throughout the two phases. They all ranged from P1 to P5, but the mode moved from P3 in phase one to P5 in phase two.

The concentration structure also changed. Whereas in phase one the combined concentration of P4 and P5 was at 52%, the combined concentration increased significantly to 73% in phase two.

In the interactive domain, the range also stayed the same throughout the two phases. They all ranged from I2 to I5. Even the main concentration stayed at I4 across the two phases. However, change could still be seen in the overall concentration structure. Whereas in phase one the combined concentration of I4 and I5 was at 69%, this combined concentration increased to 85% in phase two.

Overall, the pattern of distribution analyses based on Fig.8.13 show that there was progress in J's musical development from phase one to two. Across all three domains, J's observed musical development trended towards a more complex situation. Either the range converged to higher levels of development, or the overall concentration structure moved towards higher levels. The comparison between the two concentric profiles above (Fig 8.11 and 8.12) also offered similar illustrations of J's musical development from phase one to phase two. The concentric profiles demonstrated an outward moving tendency from simple to more complex musical behaviours of J across all three domains.

Summary comment on the overall musical behaviours of J

The detailed weekly musical behaviours comments, weekly stack and concentric profiles and weighted average levels, together with the phase analyses from sections 8.3 to 8.6 showed that J's participation and initiation in musical activities seemed to increase over eight months.

In summary, as time went by, J showed more awareness of the teacher's comments and appraisal of his work and of musical interaction with his peers. In response, he often had a big smile on his face or he screamed with happiness and satisfaction. J's vocalisation had a more distinguishable quality among the group work and he gradually gained more confidence. He was not always overshadowed by the voices of others as the observation period progressed. For certain specific musical tasks, J seemed to gradually develop more consistent performances across the time period and the two phases. For example, he sang the last word of a song or said the last word of a rhythmic pattern accurately and simultaneously with his peers and with the teacher in time and in-tune.

J's recognition of rhythmic patterns and singing/vocalisation progressed as time went on. J showed enthusiastic performances when engaging in one-to-one interactive work with physical guidance and singing. The turn taking and switch work also developed well when the teacher gave clear instructions and allowed more time for J to take part in a group activity with his maintained independent part. It seemed that the first thing J recognised in a song was its melodic features to which he responded most actively.

J's non-verbal communication ability provided important signals for the teacher and TAs about his condition. If he was aware, alert and engaged in the musical activity, he showed certain signs such as wide opened eyes and mouth, a big smile, raised hands in the air and vocalisation. If there was a sense of lack of motivation or feeling bored, he exhibited another form of behaviour such as head down, eyes closed, a thumb put in his mouth, with no response to the task of pressing the switch, or easily distracted by anyone who came through the doorway of the hall.

It seemed that motivation, imitation, and repetition were important in J's musical development where many musical learning moments took place. He seemed to learn

through listening and vocal production in imitating what was largely modelled by the music teacher. Once J had developed a familiarity and preference towards certain materials or instrumental sounds, he responded to the piece of music enthusiastically and consistently across two phases, for example, the 'hello song'.

8.7 Summary

This chapter presented a detailed and systematic case study analyses of J as an illustration of the musical behaviours and development of a child with complex needs. The analyses looked into weekly musical behaviours of J over eight months, and J's musical development was divided into two phases by a special music project launched in the music class.

By using the newly developed assessment procedure in Chapter 6 as the operational tool in this research, detailed analyses were provided from several perspectives to enhance visual presentation. These included comments concerning weekly musical behaviours, weekly musical development analyses and phase analyses, with relevant colour coded stack and concentric profiles to illustrate J's musical development over a period of eight months.

Overall, the analyses showed that there was progress in J's musical development over eight months. Across all three domains, J's observed musical behaviours moved towards more complex musical behaviours. In weekly and phase stack profiles, the musical development range and overall distribution pattern moved towards higher levels or increased their occurrences in higher levels across three domains. The concentric profiles also demonstrated an outward moving tendency from simple to more complex musical behaviours of J across all three domains.

Chapter 9

Case study analyses of K

9.1 Introduction

This chapter presents the second case study analyses to provide detailed examples of how musical behaviours may occur and change in children and young people with complex needs, especially with PMLD. Following the newly developed assessment procedure outlined in Chapter 6, several analytical techniques are used to look at different perspectives of the collected empirical data. These analytical perspectives, including weekly data analyses, weekly profile analyses, and school termly analyses with relevant stack and concentric profiles, facilitate and illustrate the data analyses of the student's musical development over a period of 13 months. In order to ensure the student's anonymity, the young person under consideration is called 'K'.

The chapter is organised into five main sections. Section 9.2 provides background information about K. Section 9.3 offers a sample of detailed weekly coding, comment, and data analyses concerning K's musical behaviours. Section 9.4 offers weekly musical development analyses of K over 13 months. Section 9.5 illustrates analyses based on stack and concentric profiles of K across three school terms. Section 9.6 summarises the findings from this case study.

9.2 Background information of K

K was an 18 years old girl at the time the researcher was conducting the fieldwork observation. From the interview with K's mother, she said that K's first language was Hindi and she lived with her mother and two younger sisters and a brother. Her father lived in India but often visited them. In the school documentation of K's IEP, K had cerebral palsy, developmental delay, Profound and Multiple Learning Difficulties (PMLD), severe physical and learning disability, feeding difficulties, microcephaly, divergent squint and epilepsy.

The school documentation reported that the last prolonged seizure that K had in the school was in November 2006 when she was feeding or drinking. The signs of K's

seizure were rolled eyes, jerkiness in both arms, rigid body and dribbling from the mouth. The duration of the seizures ranged from a few seconds to over five minutes. When K had seizures, she would have sudden strong involuntary movements and sometimes she knocked objects and equipment on to the floor. Post seizure, K liked to sleep but she did respond to speech. During the period of fieldwork observation, K had a seizure once for about one minute in an afternoon break time.

K had a manual wheelchair for mobility. In K's IEP it noted that she wore pads and needed to be changed regularly. K's food was pureed and she needed to be fed by someone who knew her. In day to day living, K needed one to one support to carry out most tasks. At times, K tended to lower her head and look down and she needed encouragement to raise her head. She had a physiotherapy session every week. K was not standing at school nor at home because of her increased physical development on weight and height. She found it hard to grab her bar without using the elastic strap on her right arm.

When interviewing with K's classroom teacher, she said that K was a cheerful person who loved to laugh and saw the funny side of everything. K communicated through lots of facial expressions, sounds/vocalisation, gestures and some eye pointing. The school staff used pictures, objects, and photos to assist K in making choices. In 2007, she began to ask for her communication book by using eye contact. Although she often indicated 'no' to an activity, she enjoyed getting involved in interaction with staff on a 'one to one' basis.

At the time of the researcher's observation, K's learning targets in her IEP were in the following areas: In the 'Interacting and Working with Others' (WWO), she was working towards 'to co-operate as part of a group in class situations' (P level 8). In the 'Attention' (ATT) aspect of learning behaviour, she was aiming 'to be able to await her turn when using social scripts' (National Curriculum level 1C). In the 'Independence and Organisational Skills' (IOS) aspect of emotional behaviour, she was working towards 'to use her range of communication aids to express her thoughts and feelings' (P level 6). K's 'Performance Indicators for Value Added Target Setting' (PIVATS) level in English was P4, Maths P3 and Science P4 in 2006. In 2007, the overall learning target of K was to access and use a switch and wait for a response during interactions

and 'to take turns in a conversation'.

The school strategies for K were to use social scripts as much as possible during registration, taking the register, and sharing stories. The support teaching strategies and learning resources for K were that she had the use of a Dynavox machine[1], communication book and switches. To make choices, she was learning how to use her communication book and switches. She was also learning to use a Dynavox machine to comment on daily activities and to interact with people in her daily life using social scripts. K used a single switch – with an adult scanning through the selections to encourage her to observe different options. Despite her poor motor control, she was able to press the single switch using her left wrist and holding a grab bar with her right hand. However, the researcher did not observe K using the machine in the music lesson.

K needed to be reminded about waiting before using her switch. Through interview, a TA commented that it was useful to give some verbal feedback before getting K to use her switch. Her mother and the school documentation IEP both reported that K enjoyed school and she was usually ready to join in activities.

9.3 An example of weekly musical behaviours comments and analyses of K

For K, the observational period was 38 weeks across three school terms from November 2006 to December 2007. In weeks 6, 12, 24, 25, 26, 32 and 33, K was absent from the music class. In weeks 8 and 9, the researcher experienced technical difficulties with the sound recording technology. In week 13, there was a prearranged substitute music teacher for the music lesson. In weeks 23 and 31, K's class went for a group trip and was away from the school. Therefore, the formal recording of K's musical behaviours started from week 2 to week 38, and video or audio data for weeks 6, 8, 12, 13, 23, 24, 25, 26, 31, 32 and 33 were not available. Consequently, the numbers of weeks with available data were in total 27 individual data entries.

Overall, 565 moments of musical engagement of K were noted over the fieldwork observational period. When allocated to the three *SoI* domains, there were 204 events in the reactive domain, 207 events in the proactive domain and 154 events in the

[1] DynaVox is the provider of augmentative and alternative communication (AAC) solutions for individuals with speech, language and learning challenges (http://www.dynavoxtech.com/).

interactive domain (see Table 9.1).

Table 9.1 Distribution of observation weeks of K

Distribution of observation over 13 months				
WK	R	P	I	All
2	16	16	12	44
3	9	8	6	23
4	12	11	9	32
5	3	7	4	14
7	4	7	7	18
9	13	13	7	33
10	9	10	8	27
11	19	20	14	53
14	8	9	5	22
15	11	11	11	33
16	9	9	8	26
17	2	1	0	3
18	9	9	1	19
19	11	11	9	31
20	14	13	12	39
21	4	3	2	9
22	8	9	5	22
27	5	3	2	10
28	11	11	8	30
29	8	8	6	22
30	2	2	2	6
34	5	4	4	13
35	5	5	5	15
36	4	4	4	12
37	1	1	1	3
38	2	2	2	6
Total	204	207	154	565

For the observational period, the musical behaviours and development of K could be further arranged into three school terms, which were natural separation points. For term one, it was the school's spring term and it was from weeks 1 to 13. For term two, it was the school's summer term and it was from weeks 14 to 23. For term three, it was the school's autumn term and it was from weeks 24 to 38. For the whole observational period, there were an average of 8 events in the reactive, 8 events in the proactive and 6 events in the interactive domain per observational week (see Table 9.2).

Table 9.2 Distribution of musical engagement moments across the reactive, proactive and interactive domains of K

Distribution of observations in the three domains				
School term	R	P	I	All
01/Spring term	85	92	67	244
02 /Summer term	76	75	53	204
03/Autumn term	43	40	34	117
Total observation number	204	207	154	565
Total weeks	27	27	27	
Average observations/Week	8	8	6	

9.3.1 An example of K's weekly musical behaviours

This section provides one example of the detailed observational descriptions, coding, comments and analyses of K's weekly musical behaviours and development. It was taken from the first week of the first term in week 2. For the details of other weeks' analyses, see Appendix K.

Term one: Week 2

Week 2 was near the end of the school Christmas break in December 2006. The teacher sang the 'hello song' in greeting to each student in the class. When the teacher sang 'hello K' (4 3 | 1 1 · – –), K waited for a few seconds before she pressed the switch to sing 'hello' (3 | 1 – – –) back to the teacher at the very last phrase of the 'hello song' (R4A, P4A, I4A). In peer greeting when singing the same 'hello song', one student pressed the switch to sing 'hello K' (1 2 | 4 – – –) and shook hands with K. The teacher commented on their good hand shaking and reminded the student to wait until K pressed her switch to say 'hello' back to him. K waited for about 45 seconds before she pressed the switch to sing 'hello' (6 | 4 – – –) back to the student (R3A, P3A, I2C).

After the 'hello song' with the peer greeting, the teacher commented that he heard K using her 'singing voice' during the activity and that was fantastic (R4A, P4A, I2A). When the teacher commented 'it's funny that everybody had got a good singing voice',

K pressed the switch to sing 'hello' (6 | 4 – – –) again during the teacher's comment (R3A, P3A, I2C).

Two professional musicians from a London orchestra visited the music class. One played the double bass and the other played the violin. The music teacher gave rough instructions for the musicians to play background music while the students participated in musical activities. The double bass started to pluck G string to produce a steady jazz beat. Then the teacher asked K to press the switch, which was pre-recorded by the teacher, three times to whisper 'Heigh ho, Heigh ho, a mountain we will go' (𝅘𝅥𝅯 | 𝅘𝅥 . 𝅘𝅥𝅯 | 𝅘𝅥 . 𝅘𝅥𝅯 | 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 | 𝅘𝅥 . 𝄇) in rhythmic pattern chanting. K's switching was in good timing for the second time but was a bit delayed with the first and third time when following the teacher's instruction (R3B, P3A).

This activity was developed further when K and another student were asked to press their switch at the same time to produce the rhythmic chanting when reading the first part of the poem 'Heigh ho, Heigh ho, a mountain we will go' (𝅘𝅥𝅯 | 𝅘𝅥 . 𝅘𝅥𝅯 | 𝅘𝅥 . 𝅘𝅥𝅯 | 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 | 𝅘𝅥 . 𝄇). The double bass played alongside with their 'switching' to provide a regular beat and the background music. However, K and the other student pressed the switch at a slightly different timing and K's switching was a little behind (R3C, P3B, I3C). The two were not exactly synchronising.

After the introduction of chanting 'Heigh ho, Heigh ho, a mountain we will go' (𝅘𝅥𝅯 | 𝅘𝅥 . 𝅘𝅥𝅯 | 𝅘𝅥 . 𝅘𝅥𝅯 | 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 | 𝅘𝅥 . 𝄇) for three times, each student had to sing a rhymed phrase in turn taking. The teacher played on the drum and assigned K the word 'drum'

for her phrase and K vocalised. When the teacher thought a phrase for K on 'we will find a drum and play it for my mom' (𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 | 𝅘𝅥 . 𝅘𝅥𝅯 | 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 | 𝅗𝅥 with chanting in quaver rhythm and drumming in crotchet for regular beat, K vocalised with an exciting voice (R4B, P3D, I2C). Her vocalisation rose to a high pitch while the teacher recorded his singing on the switch 'we will find a drum and play it for my mom' (5 5 5 5 | 5 · 6 | 5 4 3 2 | 1 – ‖). A violinist and double bass also played an accompaniment part as background music for keeping the beat. K laughed and vocalised while the teacher was asking other students' choices on their words to rhyme (R4A, P2C).

When the teacher assigned different phrases to different students, e.g. 'we will buy a bat and sit it on the mat' (5 5 5 5 | 5 · 6 | 5 4 3 2 | 1 – ‖), K pressed her switch twice to sing her part and linked the two phrases together. K then repeated her practice on her switch (R4A, P3A) when the teacher recorded another phrase 'we will find a dog and show it to the frog' (5 5 5 5 | 5 · 6 | 5 4 3 2 | 1 – ‖). After the music teacher had commented on this situation and given positive feedback to K's practice, other students also joined in by pressing their switch and laughing while the teacher recorded another student's phrase 'we will find a mouse and chase it in the house' (5 5 5 5 | 5 · 6 | 5 4 3 2 | 1 – ‖).

In explaining the structure of the song, the teacher said that the first part of the song was 'Heigh ho, Heigh ho, a mountain we will go' (𝅘𝅥𝅯 | 𝅘𝅥 . 𝅘𝅥𝅯 | 𝅘𝅥 . 𝅘𝅥𝅯 | 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 | 𝅘𝅥 .𝄽) in chanting for four times. The second part was 'we will find, we will find, we will find, we will find' (5 5 5 | 5 5 5 | 5 5 5 | 5 5 5) in singing. The third part was that

each student took turns to sing their phrase in rhyme. The whole song was accompanied by two musicians' instrumental playing on double bass and violin to give an uplifting rhythm and beat. K was the first person in the third part to sing her phrase. She pressed her switch twice and linked two phrases together in time to sing 'we will find a drum', 'and play it for my mom' (5 5 5 5 | 5 · 6 | 5 4 3 2 | 1 – ‖) (R4D, P4D, I4D).

On the second practice, the teacher wanted the students to do it in order and explained the different parts again and instructed which student went first, second and the third. The students rehearsed from the beginning. When the teacher called out K's name when it was her turn, K waited for 30 seconds before pressing the switch to sing her phrase. However, she seemed to link the two phrases well on her part (R4D, P4B, I4D).

The teacher discussed in the class about the ending for the song and he offered two choices for the students to choose. For the ending of the song, the teacher demonstrated that it finished by going back to either whispering 'Heigh ho, Heigh ho, a mountain we will go' (𝅘𝅥𝅯 | 𝅘𝅥 · 𝅘𝅥𝅯 | 𝅘𝅥 · 𝅘𝅥𝅯 | 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 𝅘𝅥𝅯 | 𝅘𝅥 · 𝄇) and getting quieter or getting louder.

The teacher recorded the answer 'that's the one' on K's switch and asked for her opinion on the ending to be louder, quieter, or in the middle. K waited for 27 seconds then pressed the switch to make her choice after the teacher had said 'in the middle'. However, later when the teacher said 'I think I would have also voted for that one (louder)' then K pressed the switch again (R2B, P2D, I2C).

Humour was used in the classroom when the teacher recorded K's part in singing in a female high pitched voice which made K laugh and she found it funny (R2B, P2B). In addition, the teacher added a clapping part with two quavers and a crochet into K's phrases. With the violin's help on playing along with the clapping part, K pressed the switch twice to link two motifs together while the musicians were playing the accompaniment. She also followed the instruction well when the teacher asked her to do it again. Her timing was good (R4B, P4B, I4D). On the third practice, the teacher whispered K's name and K waited for about 14 seconds before pressing the switch when it was her turn to sing her phrase (R4B, P4A, I4D).

Near the end of the lesson, the teacher reviewed a West African children's song called 'Che che kule' that the students had learned five weeks ago. It was a call and response song where the teacher sang each musical phrase and then the students copied the teacher's singing. The song went like this: Che che kule (5 5 4 5), Che che kofisa (5 5 4 6 5), Kofisa langa (4 6 4 5 5), Langa chi langa (4 4 6 5 5), com a dande (i · 6 5 6). One student was being a leader and K pressed her switch to be the response part which was pre-recorded by one of the TAs on each musical phrase. K seemed to press the switch well on time following the leader in taking turns (R4B, P4B, I4A).

Table 9.3 summarises the coding of K's musical engagement moments in week 2:

Table 9.3 The raw data table of K in week 2

		Domain Categorisation			Element Matching					
					R		P		I	
WK	OBS	R	P	I	Score	Element	Score	Element	Score	Element
2	K001	1	1	1	4	A	4	A	4	A
2	K002	1	1	1	3	A	3	A	2	C
2	K003	1	1	1	4	A	4	A	2	A
2	K004	1	1	1	3	A	3	A	2	C
2	K005	1	1		3	B	3	A		
2	K006	1	1	1	3	C	3	B	3	C
2	K007	1	1	1	4	B	3	D	2	C
2	K008	1	1		4	A	2	C		
2	K009	1	1		4	A	3	A		
2	K010	1	1	1	4	D	4	D	4	D
2	K011	1	1	1	4	D	4	B	4	D
2	K012	1	1	1	2	B	2	D	2	C
2	K013	1	1		2	B	2	B		
2	K014	1	1	1	4	B	4	B	4	D
2	K015	1	1	1	4	B	4	A	4	D
2	K016	1	1	1	4	B	4	B	4	A

Fig. 9.1 summarises the musical development mapping in week 2 of K, through a weekly stack profile. Her musical behaviours ranged from level 2 to 4 in the reactive,

proactive and interactive domains. The modes for the three domains were all at level 4 (demonstrated by the darker shading for these codings).

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
2	R1	0	0	P1	0	0	I1	0	0
	R2	2	13	P2	3	19	I2	5	42
	R3	4	25	P3	6	38	I3	1	8
	R4	10	63	P4	7	44	I4	6	50
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	16	100	Total	16	100	Total	12	100

Fig. 9.1 Stack profile of K in week 2

9.4 Weekly musical development analyses of K

In addition to the detailed comments and analyses for the example weeks in section 9.3, the following analyses have mapped out K's musical development over 13 months in the reactive, proactive and interactive domains. The stack profile analyses were based on the concept of relative frequency distribution and were colour coded using the assessment procedure in Chapter 6.

9.4.1 Overall summary of weekly stack profile analyses

Within the reactive, proactive and interactive domains, the researcher is mainly concerned with the range, relative concentration level and overall distribution pattern of K's musical behaviours levels. This section provides an overview for the stack profile analyses of K.

Reactive domain

Overall, Fig. 9.2 showed that the distribution pattern of K's musical behaviours in the reactive domain occurred with wide fluctuations and with scattered concentration levels between R1 to R5 in term one – especially in week 7 which suddenly dropped to R1 and R2. The range of K's musical behaviours in the reactive domain narrowed from R1 – R5 in terms one and two to R2 – R5 in term three. For the relative concentration of K's musical development levels, they fluctuated between R1 – R5 in term one, moved towards R2 – R4 in term two, and then increasingly focused between R3 – R5, especially in R4 in term three. The mode on R3 occurred for two weeks, R4 for three weeks and R5 for two weeks in term one. In term two, K's musical behaviours mainly located between R1 to R5, focused largely between R2 and R4 and centred around R3

for four weeks and R4 for four weeks. In term three, K's musical behaviours seemed to occur mainly between R2 and R5, focused largely between R3 to R5 and centred around R3 for one week, R4 for eight weeks and R5 for two weeks (see Fig. 9.2). These numbers showed a trend of moving towards more simple musical behaviours in term two, but progressed towards more complex musical behaviours in term three.

Proactive domain

Fig. 9.3 illustrated that the range of K's musical behaviours in the proactive domain was from P1 – P5 in three terms. For K's musical behaviours during the observation, the relative concentration level scattered between P1 – P4 in terms one and two and narrowed down to P2 – P5 in term three.

Overall, the distribution pattern over time showed that K's musical behaviours in the proactive domain in term one located around P1 to P5 and largely concentrated between P1 and P4 and centred around P4 for five weeks and P3 for two weeks. In term two, K's musical behaviours fluctuated from P1 to P5 and with scattered concentration levels between P1 to P4, focused on P1 for four weeks, P3 for three weeks and P4 for four weeks. In term three, the range still covered P1 to P5 but it started to move towards higher levels, largely concentrated between P2 to P5 and centred around P3 for three weeks, P4 for eight weeks and P5 for two weeks (see Fig. 9.3). These numbers showed a trend of moving towards more simple musical behaviours in term two, and progressed towards more complex musical behaviours with exceeding number of weeks in term three than terms one and two.

Interactive domain

Fig. 9.4 shows that the range of K's musical behaviours in the interactive domain was scattered mostly between I1 – I5 in terms one and two, and it shifted to higher levels and covered between I2 – I5 in term three. Considering the relative concentration of K's musical behaviours in the interactive domain, it focused between I2 – I5 in term one, I1 – I4 in term two, and it narrowed down to I2 – I4 in term three. The relative concentration levels mainly focused on I2 – I4 across three terms.

Overall, the distribution pattern over time showed that K's musical behaviours in the interactive domain in term one scattered mostly between I1 and I5, focused between I2 to I5 and centred around I2 for five weeks and I4 for three weeks in term one. In term two, the range covered from I1 to I5 in most of the weeks, focused between I1 to I4 and centred around I2 for four weeks and I4 for three weeks. In term three, the range shifted

to higher levels and covered I2 to I5, largely concentrated between I2 to I4 and focused on I2 for three weeks and I4 for eight weeks (see Fig. 9.4). These numbers showed a reducing number of weeks that belong to simpler musical behaviours from term one to term three. It also showed progress towards more complex musical behaviours with increasing number of weeks in term three than previous terms.

School term	01/Spring term								02/Summer term									03/Autumn term								
WK	2	3	4	5	7	9	10	11	14	15	16	17	18	19	20	21	22	27	28	29	30	34	35	36	37	38
R1	0	22	0	0	50	0	0	11	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R2	13	0	25	0	50	15	0	16	0	0	33	100	0	9	21	0	0	0	18	0	0	20	0	0	0	0
R3	25	22	50	0	0	8	0	53	38	18	0	0	56	91	57	75	25	20	0	13	50	0	40	0	0	0
R4	63	44	25	33	0	31	100	21	50	55	33	0	44	0	0	25	50	60	45	63	50	20	60	75	100	50
R5	0	11	0	67	0	46	0	0	13	27	11	0	0	0	21	0	25	20	36	25	0	60	0	25	0	50
R6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 9.2 Stack profile of K in the reactive domain over 13 months

School term	01/Spring term								02/Summer term									03/Autumn term								
WK	2	3	4	5	7	9	10	11	14	15	16	17	18	19	20	21	22	27	28	29	30	34	35	36	37	38
P1	0	0	9	14	43	0	10	15	22	0	56	0	33	64	46	33	0	0	18	0	0	0	20	0	0	0
P2	19	25	36	14	57	15	10	25	22	0	0	100	22	9	31	0	0	0	0	0	0	25	20	0	0	50
P3	38	25	55	14	0	8	10	45	11	27	11	0	44	27	0	33	44	33	9	13	50	0	40	0	0	0
P4	44	38	0	29	0	46	70	15	33	73	33	0	0	0	0	33	44	33	36	63	50	75	20	75	100	50
P5	0	13	0	29	0	31	0	0	11	0	0	0	0	0	23	0	11	33	36	25	0	0	0	25	0	0
P6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 9.3 Stack profile of K in the proactive domain over 13 months

School term	01/Spring term								02/Summer term									03/Autumn term								
WK	2	3	4	5	7	9	10	11	14	15	16	17	18	19	20	21	22	27	28	29	30	34	35	36	37	38
I1	0	33	11	25	43	0	13	21	40	0	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I2	42	17	67	50	57	29	0	29	0	18	0	0	100	100	75	100	0	0	0	0	50	25	80	0	0	50
I3	8	0	22	0	0	0	0	29	0	9	25	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0
I4	50	50	0	25	0	29	88	21	60	64	13	0	0	0	8	0	80	100	88	67	50	75	20	75	100	50
I5	0	0	0	0	0	43	0	0	0	9	0	0	0	0	17	0	0	0	13	33	0	0	0	25	0	0
I6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 9.4 Stack profile of K in the interactive domain over 13 months

Overall, the range of K's musical behaviours in three domains did not have a dramatic change. It stayed more or less at the same range throughout the three terms in the proactive domain (P1 to P5), and became a little narrower towards more complex musical behaviours in term three for reactive (R2 to R5) and interactive domain (I2 to I5). Some nuance changes occurred in term two which regressed towards more simple musical behaviours in reactive and proactive domains, except in the interactive domain. Compared with terms one and two, the relative concentration levels moved gradually towards more complex musical behaviours in term three across all three domains over the 13 months.

9.4.2 Weekly weighted average level analyses

This section looks at the weekly weighted average level within each domain to provide additional analytical perspectives for the data analyses. For the working assumption and the usefulness of the weekly weighted average level, see section 8.5.2.

Table 9.4 shows the weekly weighted average level of K which is based on the data from the weekly frequency distribution table (see Chapter 6).

Table 9.4 Weekly weighted average levels of K

Weekly weighted average levels				
WK	R	P	I	Overall
2	3.5	3.3	3.1	3.3
3	3.2	3.4	2.7	3.1
4	3.0	2.5	2.1	2.5
5	4.7	3.4	2.3	3.4
7	1.5	1.6	1.6	1.5
9	4.1	3.9	3.9	4.0
10	4.0	3.4	3.6	3.7
11	2.8	2.6	2.5	2.6
14	3.8	2.9	2.8	3.1
15	4.1	3.7	3.6	3.8
16	2.8	2.2	1.9	2.3
17	2.0	2.0	N/A	2.0
18	3.4	2.1	2.0	2.5
19	2.9	1.6	2.0	2.2
20	3.2	2.2	2.7	2.7
21	3.3	2.7	2.0	2.6
22	4.0	3.7	3.8	3.8
27	4.0	4.0	4.0	4.0
28	4.0	3.7	4.1	4.0
29	4.1	4.1	4.3	4.2
30	3.5	3.5	3.0	3.3
34	4.2	3.5	3.5	3.7
35	3.6	2.6	2.4	2.9
36	4.3	4.3	4.3	4.3
37	4.0	4.0	4.0	4.0
38	4.5	3.0	3.0	3.5

To further facilitate the analyses, the following figures (Fig. 9.5 to 9.9) used the data from Table 9.4 to show K's musical development trajectories over 13 months. Each point in the figures refers to the weekly average level either for the individual domains or for the overall level.

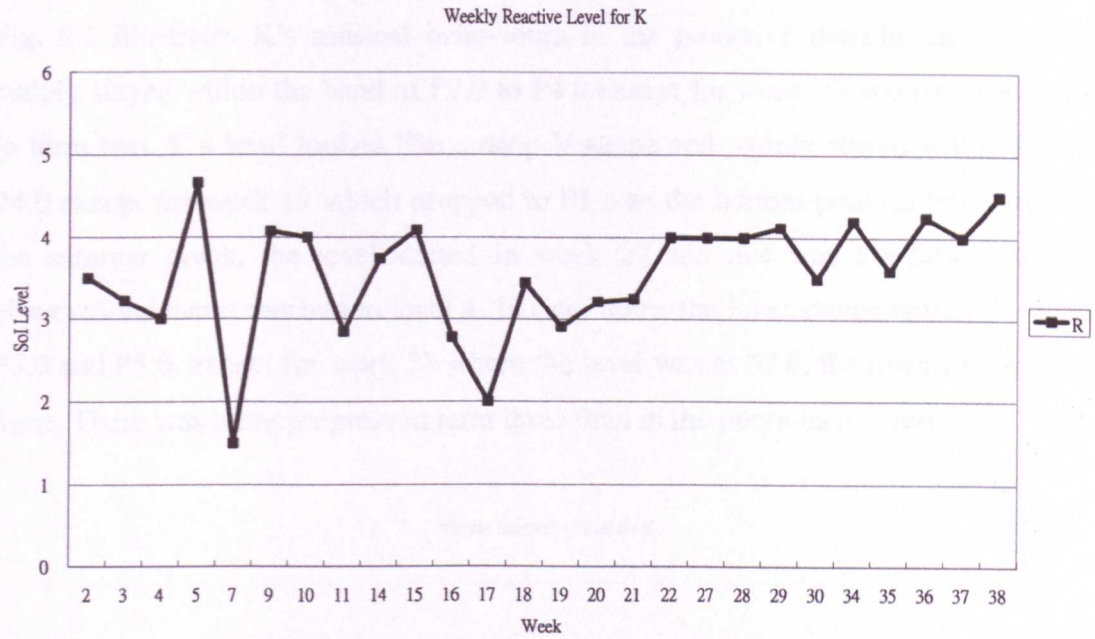


Fig. 9.5 Weekly weighted average levels of K in the reactive domain

For the reactive domain in Fig. 9.5, it was unstable and had large fluctuations during term one and the level stayed within the band of R1.0 to R5.0 from weeks 2 to 11. In term two (from weeks 14 to 22), the level stayed within the band of R2.0 and R4.0, except for week 15 where the level was at R4.1. After the summer break and term three began (from weeks 27 to 38), the level stayed within the band of R3.0 and R5.0. However, from week 19 onward, the reactive level gradually moved towards more complex musical behaviours and reached R4 and above after week 22.

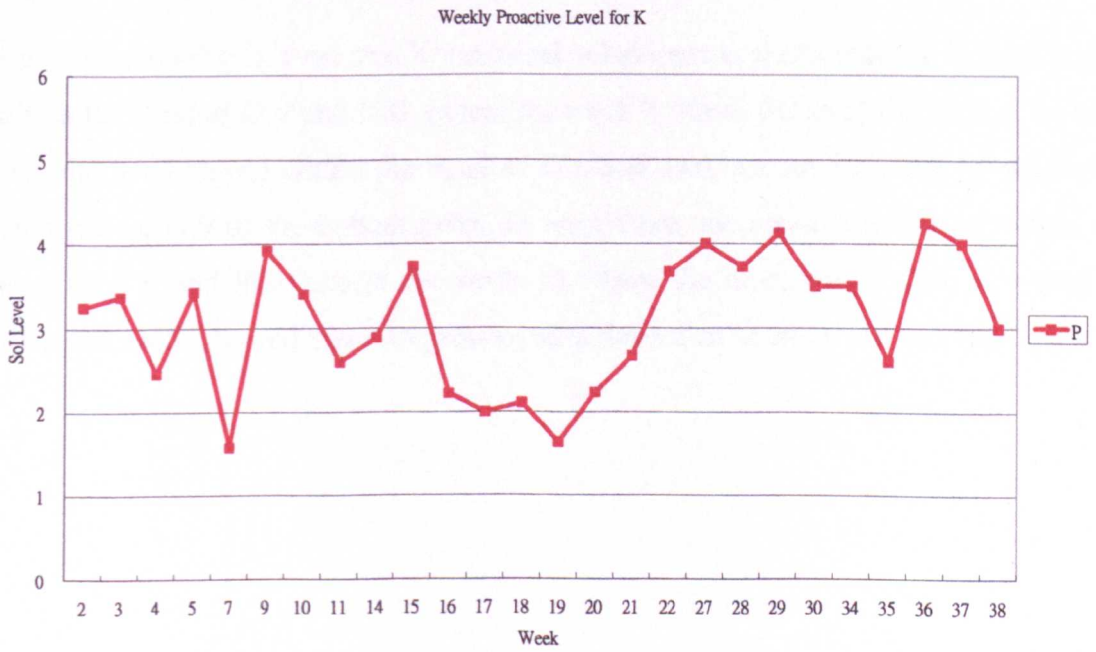


Fig. 9.6 Weekly weighted average levels of K in the proactive domain

Fig. 9.6 illustrates K's musical behaviours in the proactive domain. In term one, it mainly stayed within the band of P2.0 to P4.0 except for week 7's sudden drop to P1.6. In term two, K's level looked like a deep V shape and mainly stayed within P2.0 and P4.0 except for week 19 which dropped to P1.6 as the bottom point in term two. After the summer break, the level started in week 27 and this was the first time in the observations that it reached to level 4. In term three, the level stayed within the band of P3.0 and P5.0, except for week 35 where the level was at P2.6, the lowest point in term three. There was more progress in term three than in the previous two terms.

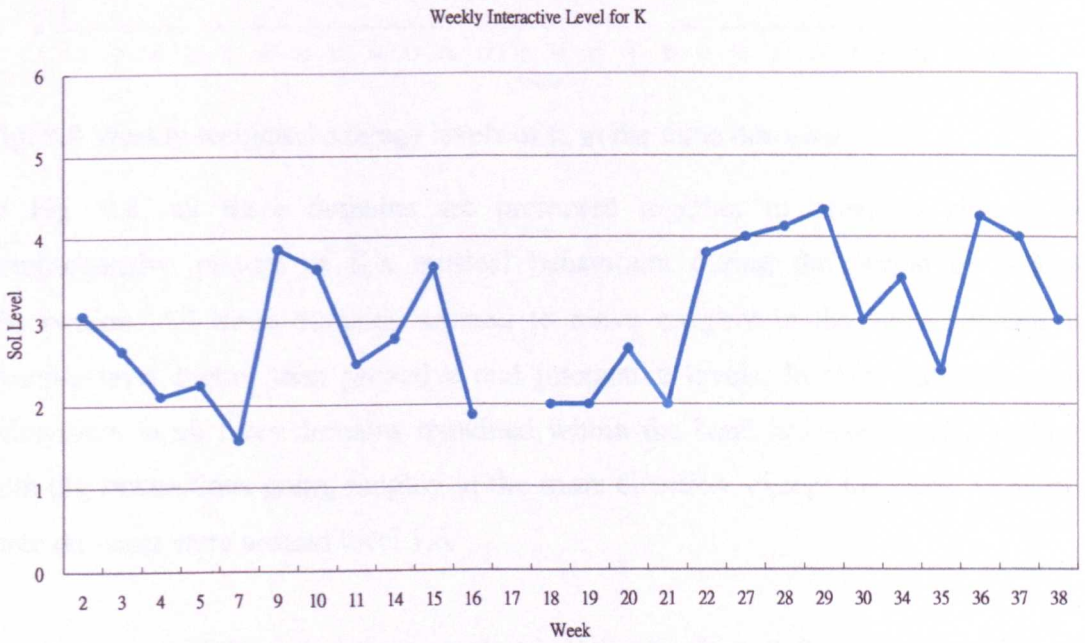


Fig. 9.7 Weekly weighted average levels of K in the interactive domain

Fig. 9.7 shows that in term one, K's musical behaviours in the interactive domain stayed within the band of I2.0 and I4.0, except for week 7 where the level was at I1.6. In term two, the level stayed within the band of I2.0 and I4.0, except for week 16 where the level was at I1.9 as the bottom point. In term three, the mean level stayed within the band of I3.0 and I5.0, except for week 35 where the level was at I2.4. K's musical behaviours also showed more progress in term three than in terms one and two.

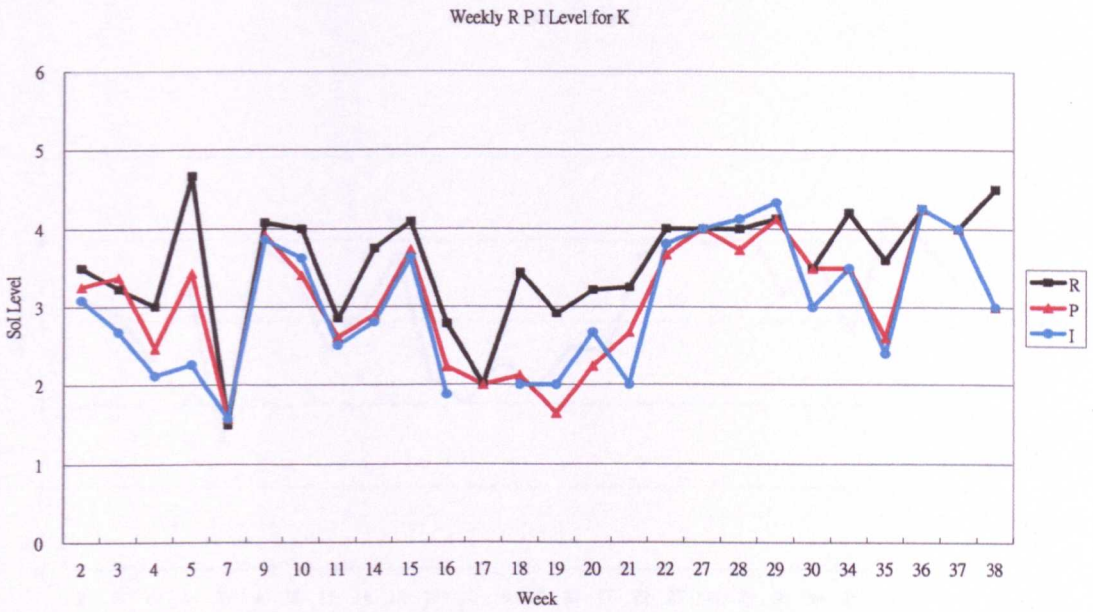


Fig. 9.8 Weekly weighted average levels of K in the three domains

In Fig. 9.8, all three domains are presented together in order to give a more comprehensive picture of K's musical behaviours during the period of fieldwork observation. All three domains seemed to move roughly in the same manner with reactive level higher than proactive and interactive levels. In term one, the musical behaviours in all three domains remained within the band between level 2 to level 5 with big fluctuations going roughly in the same direction, except for week 7 where the three domains were around level 1.6.

In term two, which started from week 14, these levels had fluctuations within three domains but went in different directions within the band between level 1 to level 4, except for week 15 where the reactive domain reached to R4.1. When term three started in week 27, all three domains were at level 4 and they moved up and down within the band between level 3 and level 5 until the end of term three, except for week 35 where the proactive domain was at level P2.6 and the interactive domain was at level I2.4. During term three, there were more level points which exceeded level 4 in the reactive and interaction domains towards more complex musical behaviours than terms one and two.

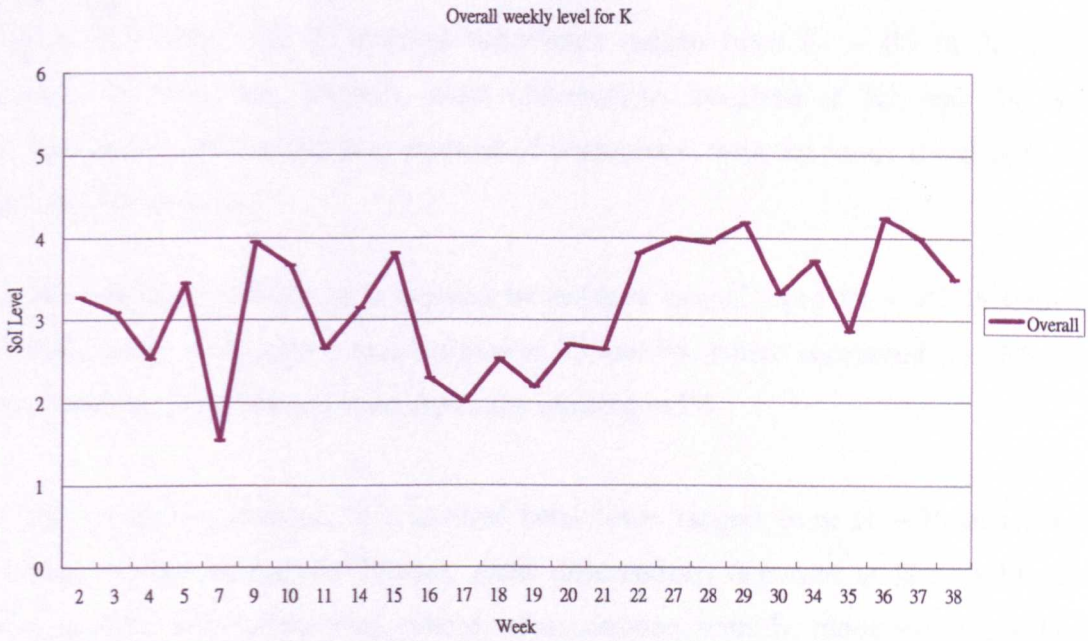


Fig. 9.9 Weekly overall weighted average levels of K

Overall summary from weekly level analyses

In summary, the weekly level analyses presented above showed that K's musical development levels had large fluctuations in the three domains but it moved gradually towards more complex musical behaviours from term one to term three. As we can see on the overall weekly level in Fig. 9.9, the musical development pattern showed fluctuations within the band of levels 2 to 4 in term one, except for week 7 at an overall level 1.5, levels 2 to 4 in term two, and levels 3 to 5 in term three, except for week 35 at the overall level 2.9.

In addition, Fig. 9.9 also showed that around six weeks' overall occurrences happened between the band of level 2 and 3 from weeks 16 to 21 in term two which showed regression in K's overall musical behaviours in term two. However, K's music behaviours showed gradual development in the overall musical development level in term three compared to terms one and two.

9.5 Concentric and stack profiles of K for three terms

This section presents another perspective to see K's musical development over 13 months, based on summarising termly data rather than weekly data. The termly profiles are produced by aggregating the weekly data within terms one, two and three into three analytical units, so that a higher analytical perspective can be provided.

Term one

Fig. 9.10 showed that K' musical behaviours ranged from R1 – R5 in the reactive domain in term one. Overall, most observations occurred at R3 and R4, which accounted for 68% of the total number of occurrence, with the mode locating at R4 in the reactive domain.

In the proactive domain, K's musical behaviours ranged from P1 – P5 in term one. Overall, most observations concentrated at P3 and P4, which accounted for 58% of the total number of occurrence with the mode locating at P4.

In the interactive domain, K's musical behaviours ranged from I1 – I5 in term one. Overall, in the interactive domain, most observations occurred at I2 and I4, which accounted for 69% of the total number of occurrence, with the mode locating at I2 (see Fig. 9.10).

Stack Profile					
Term one					
Domain	%	Domain	%	Domain	%
R1	7	P1	10	I1	16
R2	14	P2	24	I2	36
R3	27	P3	28	I3	10
R4	41	P4	30	I4	33
R5	11	P5	8	I5	4
R6	0	P6	0	I6	0

Fig. 9.10 Stack profile of K in term one

We can also use a termly concentric profile (Fig. 9.11) to summarise the analyses above. This concentric profile illustrates K's musical development mapping in term one.

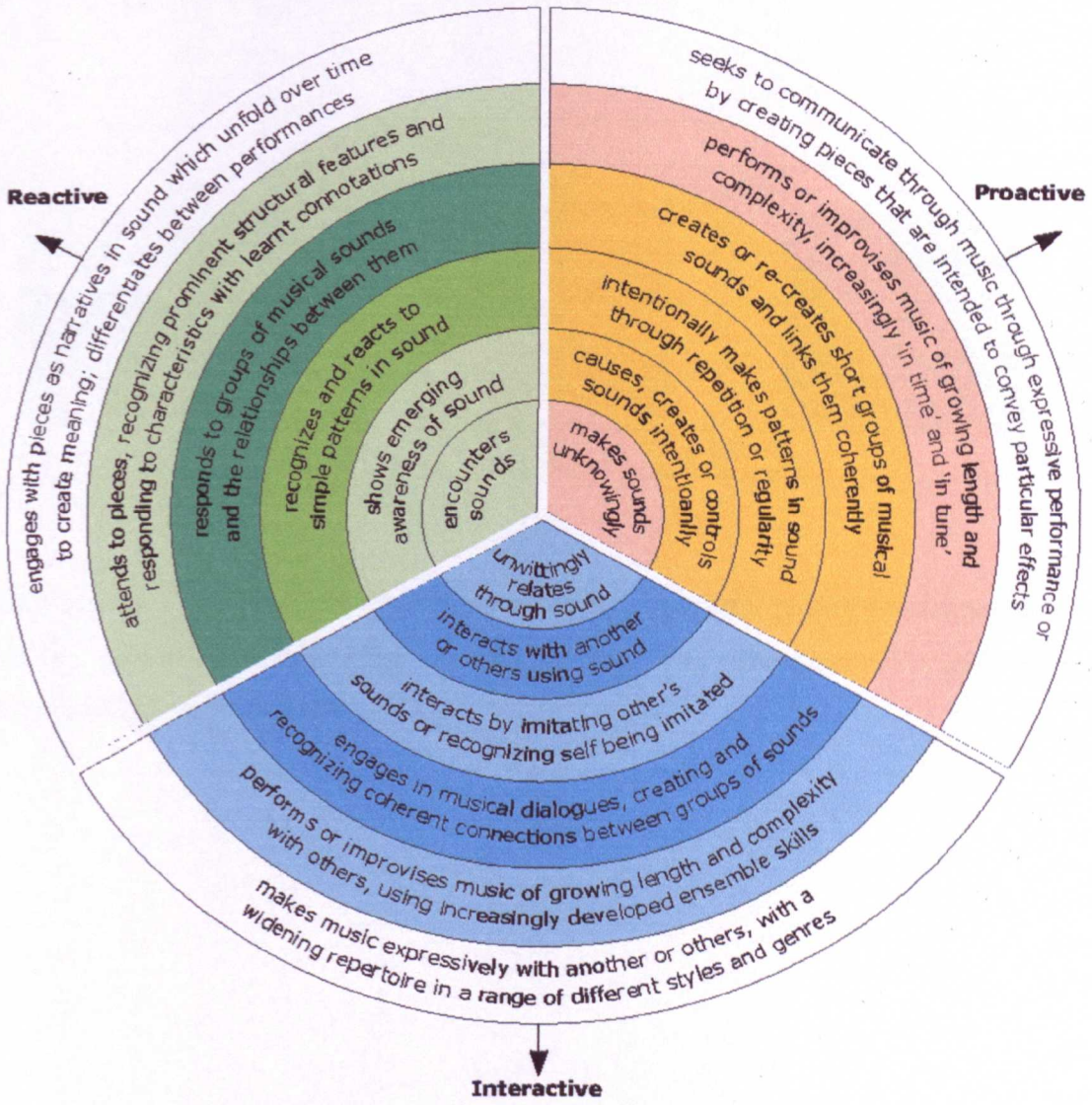


Fig. 9.11 Concentric profile of K in term one

Term two

Fig. 9.12 showed that K's musical behaviours ranged from R1 to R5 in the reactive domain in term two. Overall, in the reactive domain, most observations occurred at R3 and R4, which accounted for 72% of the total number of occurrence, with the mode locating at R3.

In the proactive domain, K's musical behaviours ranged from P1 to P5 in term two. Overall, in the proactive domain, most observations occurred at P1 and P4, which accounted for 57% of the total number of occurrence, with the mode locating at P1.

In the interactive domain, K's musical behaviours ranged from I1 to I5 in term two. Overall, in the interactive domain, most observations occurred at I2 and I4, which

accounted for 73% of the total number of occurrence, with the mode locating at I2 (see Fig. 9.12).

Term two					
Domain	%	Domain	%	Domain	%
R1	3	P1	32	I1	13
R2	12	P2	13	I2	43
R3	43	P3	23	I3	8
R4	29	P4	25	I4	30
R5	13	P5	7	I5	6
R6	0	P6	0	I6	0

Fig. 9.12 Stack profile of K in term two

Like what has been done before, we can use a termly concentric profile to summarise the analyses above. The concentric profile in Fig. 9.13 illustrates K's musical development mapping in term two.

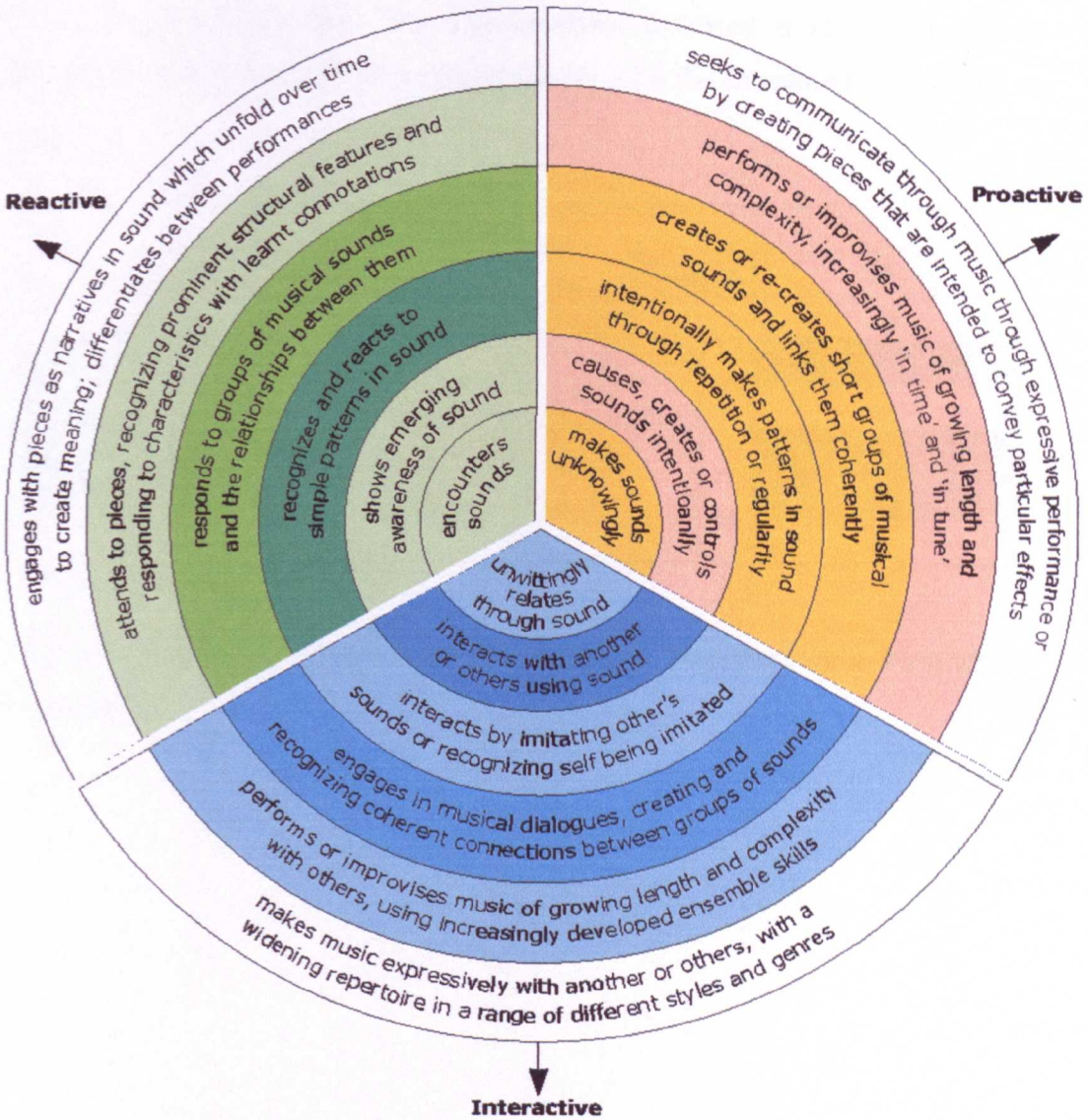


Fig. 9.13 Concentric profile of K in term two

Term three

In the reactive domain (see Fig. 9.14), K's musical behaviours ranged from R2 to R5 in term three. Overall, in the reactive domain, most observations occurred at R4 and R5, which accounted for 81% of the total number of occurrence, with the concentration locating at R4.

In the proactive domain, K's musical behaviours ranged from P1 to P5 in term three. Overall, in the reactive domain, most observations occurred at P4 and P5, which accounted for 70% of the total number of occurrence, with the concentration locating at P4.

In the interactive domain, K's musical behaviours ranged from I2 to I5 in term three. Overall, in the interactive domain, most observations occurred at I2 and I4, which accounted for 89% of the total number of occurrence, with the concentration locating at I4 (see Fig. 9.14).

Term three					
Domain	%	Domain	%	Domain	%
R1	0	P1	8	I1	0
R2	7	P2	8	I2	21
R3	12	P3	15	I3	0
R4	53	P4	50	I4	68
R5	28	P5	20	I5	12
R6	0	P6	0	I6	0

Fig.9.14 Stack profile of K in term three

Fig. 9.15 illustrates K's musical development mapping in term three by using a termly concentric profile.

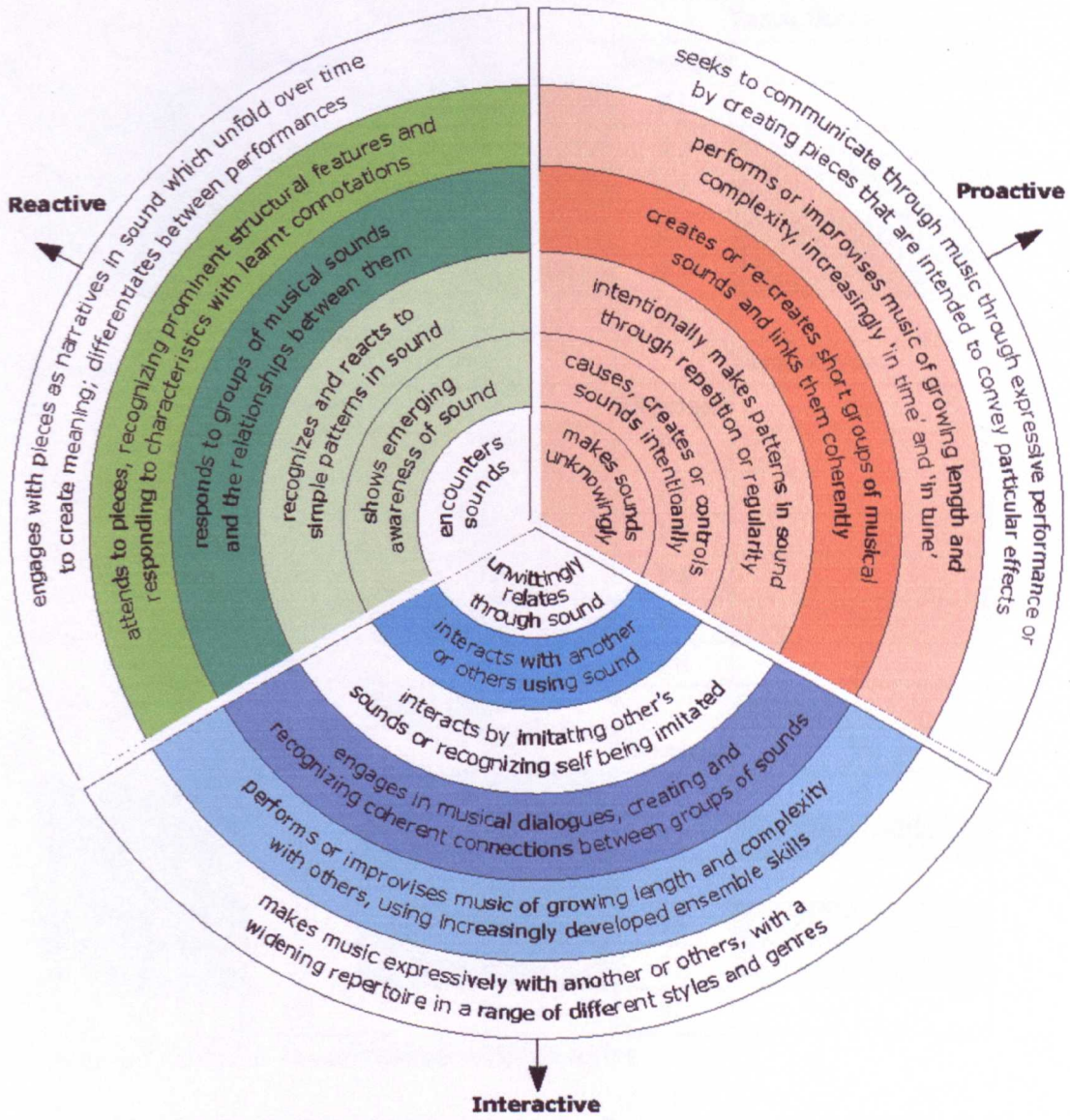


Fig. 9.15 Concentric profile of K in term three

Termly comparison and analyses

Fig. 9.16 provides further investigation of the musical development changes between terms one, two and three. It is a large termly stack profile of K's musical development mapping. By putting three termly stack profiles together, it offers an easier comparison of the musical development changes between the three terms.

Termly Profile					
Term one		Term two		Term three	
Domain	%	Domain	%	Domain	%
R1	7	R1	3	R1	0
R2	14	R2	12	R2	7
R3	27	R3	43	R3	12
R4	41	R4	29	R4	53
R5	11	R5	13	R5	28
R6	0	R6	0	R6	0
Term one		Term two		Term three	
Domain	%	Domain	%	Domain	%
P1	10	P1	32	P1	8
P2	24	P2	13	P2	8
P3	28	P3	23	P3	15
P4	30	P4	25	P4	50
P5	8	P5	7	P5	20
P6	0	P6	0	P6	0
Term one		Term two		Term three	
Domain	%	Domain	%	Domain	%
I1	16	I1	13	I1	0
I2	36	I2	43	I2	21
I3	10	I3	8	I3	0
I4	33	I4	30	I4	68
I5	4	I5	6	I5	12
I6	0	I6	0	I6	0

Fig. 9.16 Stack profiles of K in comparison of three terms

In comparing K's musical development in terms one, two, and three through Fig. 9.16, there were gradual changes across all three domains. In the reactive domain, the range converged to higher levels from R1 to R5 in terms one and two and from R2 to R5 in term three. The mode moved from R4 in term one to R3 in term two and then back to R4 in term three. However, K seemed to reduce her simpler musical behaviours in R1 and R2 from term one to term three. Term one had 21%, term two had 15% and term three had 7%. Fig. 9.16 also shows that the concentration structure moved towards more complex musical behaviours in term three by increased activities at level 4 and 5 which accounted for 81% in term three as compared with term one – 52% and for term two – 42%.

In the proactive domain, the range stayed the same throughout the three terms. They all ranged from P1 to P5. The mode moved from P4 in term one to P1 in term two and back to P4 in term three. It showed that K's musical behaviours in the proactive domain regressed from term one to term two. When looking at simpler musical behaviours at level P1 to P2, term one had 34%, term two had 35% and term three had 16%. This also confirms that K's musical behaviours in the proactive domain regressed from term one to term two. However, the concentration structure in term three moved to P4 and P5 for 70%. This showed that it moved towards more complex musical behaviours in term three and increased significantly by its percentage of the total number of occurrence at level 4 and 5 (70%) compared with term one (38%) and term two (32%).

In the interactive domain, the range converged to higher levels from I1 to I5 in term one and two to R2 to R5 in term three. The mode moved from I2 in terms one and two to I4 in term three. It showed that the mode progressed from term one to term three. Moreover, for simpler musical behaviours at level I1 and I2, term one had 52% and term two had 56% and term three had 21%. It appeared that there was little regression from term one to term two even though the mode stayed at the same level. In addition, the concentration structure for more complex musical behaviours at level I4 and I5 increased significantly in term three. It was 37% in term one, 36% in term two and 80% in term three.

Overall, the pattern of distribution analyses based on Fig. 9.16 showed that there were some regressions from term one to term two in the three domains, but it showed progress in K's musical behaviours in term three. Across all three domains, K's observed musical behaviours trended towards more complex musical behaviours in either the range converging to higher levels of development, or the overall concentration structure moving towards higher levels in term three. The comparison between the three concentric profiles also offered similar illustrations of K's musical development from term one to term three. The concentric profiles demonstrated an outward moving tendency from simple to more complex musical behaviours of K across all three domains in term three.

9.6 Summary

This chapter presented the detailed and systematic case study analyses of K as an illustration of the musical behaviours and development of a young person with complex needs, especially PMLD. The analyses looked into weekly musical behaviours of K over 13 months, and K's musical development was divided into three school terms. Using the newly developed assessment procedure in Chapter 6, detailed analyses were provided from comments concerning weekly musical behaviours, weekly and termly musical development analyses, with relevant weighted average level analyses, and colour coded stack and concentric profiles to illustrate K's musical development over the observational period.

Overall, the analyses showed that there was some regression from term one to term two in K's musical behaviours in the three domains. However, the three domains all showed progress in K's musical behaviours in term three compared to terms one and two. Across all three domains, K's observed musical behaviours moved towards more complex musical behaviours. Either the range converged to higher levels of development, or the overall concentration structure moved towards higher levels in term three compared to terms one and two. The concentric profiles also demonstrated an outward moving tendency from simpler to more complex musical behaviours of K across all three domains in term three.

Chapter 10

Case study analyses of H

10.1 Introduction

This chapter presents the third case study analyses to provide detailed examples of how musical behaviours may change in children and young people with complex needs. Following the assessment procedure in Chapter 6, weekly data analyses, weekly profile analyses and termly analyses, relevant weighted average analyses and stack and concentric profiles are provided to facilitate and illustrate the data analyses of the student's musical development over a period of 13 months. Due to the need for confidentiality, the young person under consideration is called 'H'.

This chapter is organised into five main sections. Section 10.2 provides the background information of H. Section 10.3 offers an example of detailed weekly coding, comment, and analyses concerning H's musical behaviours. Section 10.4 offers weekly musical development analyses of H over 13 months. Section 10.5 illustrates termly analyses based on stack and concentric profiles of H across three school terms. Section 10.6 summarises the findings from the case study.

10.2 Background information of H

H was aged 18 years when the researcher was conducting the fieldwork observation. His first language was Bengali. He had severe learning difficulties and complex medical problems, e.g. following a tracheotomy, for which he needed 24 hour nursing care. A nurse stayed in the classroom with him and was present at all times in order to provide medical care and attention to H's personal needs. However, H's nursing staff changed daily. Sometimes, H needed to be encouraged to walk even though he had used an electric wheelchair from July 2006. In the school, H joined a physiotherapy group every week and the school had planned for him to go to a local college on one morning a week from September 2007.

H's IEP recorded that he was a cheerful and cooperative boy who engaged in learning willingly. He had become more independent in finding his own way around the school. H participated readily in group activities and had made enormous progress with his social skills. He appeared to be confident with his learning and was proud of his achievements. H was able to write his first name, and appeared determined to succeed. With speech and language support on one afternoon a week, H was developing an increased use of Makaton[1]. Although he had limited understanding of concepts and language, he enjoyed joining in group activities. H was not able to use symbols independently and his understanding was at a two to three word level. He could be quite shy with new people, but quickly relaxed when humour was used.

H enrolled with the special school in September 2003 and he was in Year 13 in the academic year of 2007/2008. The learning goals of H were as follows: In the 'Interacting and Working With Others' (WWO), it was 'to be able to let an adult know when he had not understood' (P level 8). In the 'Attention' (ATT) aspect of learning behaviour, it was 'to be able to review his own work and suggest ways it could be improved' (P level 8). In the 'Independence and Organisational Skills' (IOS) aspect of emotional behaviour, it was 'to be able to express his wishes and opinions accurately, using Talking Mats[2] where appropriate' (P level 8). H's level of attainment in PIVATS[3] were rated P7 for English and P6 for Maths – and he could match numbers. His overall learning target in 2006/2007 was 'to extract information from a variety of real-life sources' and a specific target was 'to find information from timetables, maps and signs and share what he had learned'.

In H's IEP, the achievement criterion was that H could 'use a five point Talking Mat to express his feelings about an activity or event'. The learning resources included a five point Talking Mat, communication book and Makaton. The aim of the teaching strategies was to encourage H to give his opinion about things and move away from always saying things are good or bad. The supporting teaching strategies for the school

[1] Makaton is a sign language that it uses signs and symbols to teach communication, language and literacy skills to people with communication and learning difficulties (http://www.makaton.org/).

[2] Talking mats was originally developed by the Alternative and Augmentative Communication (AAC). It used a mat with pictures symbols attached as the basis for communication. It is designed to help people with communication difficulties to think about issues discussed with them, and provide them with a way to effectively express their opinions (http://www.talkingmats.com/).

[3] PIVATS was first published in 1999 by Lancashire County Council. PIVATS is an assessment programme used nationally to measure pupil progress through the 'P' Scales and up to National Curriculum Level 4. It differentiates each P level into five stepping stones and is an extended version of the P levels. This programme has become a leader in SEN assessment and the target setting for students who may be underachieving should be regarded as a strategy in the process of raising attainment and assisting individual students to make progress in curricular areas (http://www.lancashire.gov.uk/corporate/web/?PIVATS/14585).

staff were to utilise symbols on written work and as prompts to activities to assist H's understanding. The classroom teacher also used Makaton and gestures to assist verbal communication with H. Sometimes the teachers needed to check H's understanding of instructions, and they often modelled for him.

H would sometimes agree to things without necessarily understanding what they meant. He had a communication book and was at the early stages of using it. During the interview, the classroom teacher hoped that his family would continue H's learning by delivering the home strategies. At home, his parents or carers were encouraged to play games with H using his communication book to familiarise him with it and to make its use more acceptable for him.

10.3 An example of weekly musical behaviours comments and analyses of H

For H, the observational period was 38 weeks across three school terms from November 2006 to December 2007. In weeks 5, 10, 17, 29 and 36, H was absent from the music class. In weeks 8 and 9, the researcher experienced technical difficulties with the sound recording technology. In week 13, there was a prearranged substitute music teacher for the music lesson. In weeks 23 and 31, H's class went for a group trip and was away from the school. Therefore, the formal recording of H's musical behaviours started from week 2 to week 38. The video or audio data for weeks 5, 8, 9, 10, 13, 17, 23, 29, 31 and 36 were not available. Consequently, the numbers of weeks with available data were in total 28 weeks.

Overall, 604 moments of musical engagement of H were noted over the fieldwork observational period. When allocated to the three *SoI* domains, there were 219 events in the reactive domain, 215 events in the proactive domain and 170 events in the interactive domain (see Table 10.1).

Table 10.1 Distribution of observation weeks of H

Distribution of observation over 13 months				
WK	R	P	I	All
2	7	8	7	22
3	7	8	7	22
4	12	12	11	35
6	8	9	5	22
7	2	2	2	6
11	12	12	12	36
12	9	8	8	25
14	11	12	6	29
15	13	13	11	37
16	12	11	8	31
18	8	9	2	19
19	9	9	2	20
20	9	6	4	19
21	8	8	3	19
22	7	7	6	20
24	9	6	8	23
25	18	17	15	50
26	9	9	9	27
27	6	3	3	12
28	7	7	7	21
30	2	3	2	7
32	10	8	6	24
33	2	1	0	3
34	8	12	12	32
35	7	8	7	22
37	3	3	3	9
38	4	4	4	12
Total	219	215	170	604

For the observational period, the musical behaviours and development of H could be further divided into three sequential school terms as natural separation points. For term one, it was the school's spring term and it was from weeks 1 to 13. For term two, it was the school's summer term and it was from weeks 14 to 23. For term three, it was the school's autumn term and it was from weeks 24 to 38. For the whole observational period, there were on average 8 events in the reactive, 8 events in the proactive and 6 events in the interactive domains per observational week (see Table 10.2).

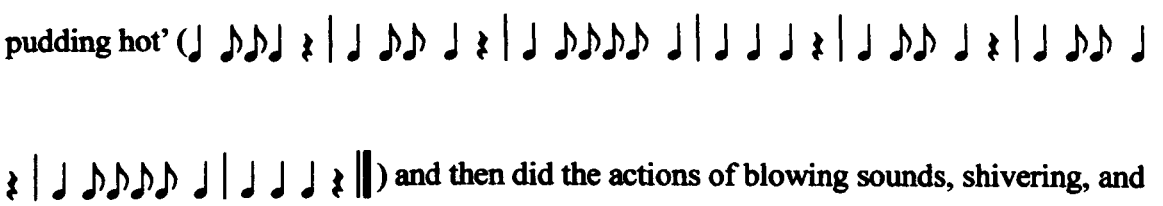
Table 10.2 Distribution of musical engagement moments across the reactive, proactive and interactive domains of H

Distribution of observations in the three domains				
School term	R	P	I	All
01/Spring term	57	59	52	168
02 /Summer term	77	75	42	194
03/Autumn term	85	81	76	242
Total observation number	219	215	170	604
Total weeks	27	27	27	
Average observations/Week	8	8	6	

10.3.1 An example of H's weekly musical behaviours

The following section provides an example of the detailed observational descriptions, coding, comments and analyses of H's weekly musical behaviours and development. It was taken from week 14. For the details of the other weeks' analyses, see Appendix L.

Term two: Week 14

After the school's Easter break, the students came back to the school in week 14. In the beginning of the music lesson, the teacher clapped the rhythm of the poem 'Pease pudding hot' () and then did the actions of blowing sounds, shivering, and getting sick. Near the end of the teacher's demonstration, H seemed to recognise the poem and said 'oh, yeah' (R4A, P3D).

In pair interactive activity, H and K worked together. K pressed the switch to read the poem and H tapped on the big tambour when there was a rest at the end of every phrase. H's drumming was accurate when taking turns with K, and was increasingly in time. The teacher helped H to play the drum, giving only a partial verbal prompt (R4B, P4B, I4D). On their second practice, H listened well to the poem and took turns correctly with K in good timing (R5A, P5A, I4D). The teacher commented, "Fantastic work, H, very good listening".

In the poem reading task, the teacher asked H to imitate the words while another student did a loud banging sound on a drum. Their reading went like this:

T: Pease pudding hot. H: Pease.

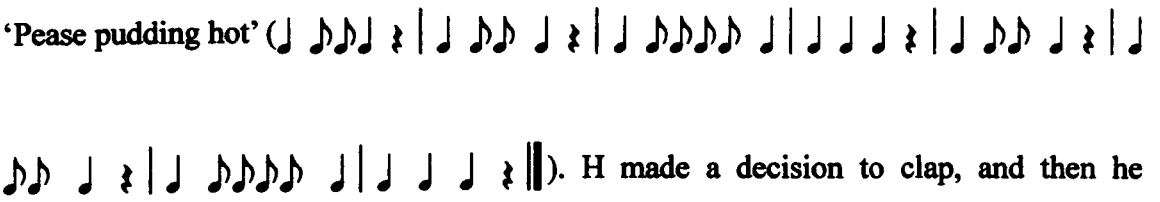
T: Pease pudding cold. Pease pudding in the pot, nine days. H: days.

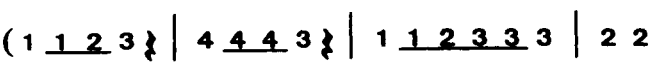
T: old. H: ye.

T: some like it hot. H: like it (same time as T).

T: some like it cold. H: like it (same time as T).

T: some like it in the pot, nine days old. H: old. (R4B, P3D, I3C).

The teacher asked each student to think of a sound to make by tapping, clapping, or vocalising when the teacher stopped tapping on the rhythmic patterns for the poem 'Pease pudding hot' (). H made a decision to clap, and then he demonstrated the clapping (P3D). H clapped a sound after the teacher's drumming pattern. H seemed to do very good work in taking turns with the teacher (R4D, P4D, I4D). After the practice, TAs commented that H did excellent work and was top of the class. On the second practice, the teacher tapped the rhythm very quietly on a drum for a change. H tapped quietly following the teacher's modelling on the rhyme 'Pease pudding hot' (R4D, P4D, I4D).

The teacher played on the piano the tune: () to go with the poem. The students were asked to tap a sound when there was a pause in the tune. H's tapping was quiet but he seemed to take turns well with the teacher (R4B, P4A, I4D).

When introducing a new note in the music lesson, the teacher reviewed what the students had learned on the notes of 'doh, re, mi and sol'. The students were going to learn a new note that appeared in the song. The teacher demonstrated by singing the whole song again while missing out the new note (fa), H responded by saying 'Oh,

Yeah!' It seemed that H had more verbal response towards the teacher's teaching than before, with even more enthusiasm (R4D, P3D).

When the teacher recorded his singing on the switch and asked for help to work the switch, H volunteered and spoke in a loud voice 'me!' H pressed the switch in good timing by himself for the whole song (R5A, P5A). On the second practice, H showed some hesitation when pressing the switch which left some pauses between the phrases (R5A, P4B). The teacher corrected H and wanted him to link the musical phrases together without leaving any space between them. H did better switching with accurate timing on this occasion (R5A, P5A).

Table 10.3 summarises the coding of H's musical engagement moments in week 14:

Table 10.3 The raw data table of H in week 14

		Domain Categorisation			Element Matching					
					R		P		I	
14	H063	1	1		4	A	3	D		
14	H064	1	1	1	4	B	4	B	4	D
14	H065	1	1	1	5	A	5	A	4	D
14	H066	1	1	1	4	B	3	D	3	C
14	H067		1				3	D		
14	H068	1	1	1	4	D	4	D	4	D
14	H069	1	1	1	4	D	4	D	4	D
14	H070	1	1	1	4	B	4	A	4	D
14	H071	1	1		4	D	3	D		
14	H072	1	1		5	A	5	A		
14	H073	1	1		5	A	4	B		
14	H074	1	1		5	A	5	A		

The following stack profile (Fig. 10.1) summarises H's musical development mapping in week 14. His musical behaviours ranged from level 4 to 5 in the reactive, level 3 to 5 in the proactive and level 3 to 4 in the interactive domains. The modes for the reactive, proactive, and interactive domains were all located at level 4.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
14	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	4	33	I3	1	17
	R4	7	64	P4	5	42	I4	5	83
	R5	4	36	P5	3	25	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	11	100	Total	12	100	Total	6	100

Fig. 10.1 Stack profile of H in week 14

10.4 Weekly musical development analyses of H

Following the detailed analyses for the example week in section 10.3, this section provides the time series analyses of H's musical behaviours over 13 months in the reactive, proactive and interactive domains. Weekly stack profiles and weighted average level analyses were utilised to give different perspectives of analysing the data.

10.4.1 Overall summary of weekly stack profile analyses

The following analyses mapped out H's musical behaviours over 13 months in the reactive, proactive and interactive domains for the whole fieldwork observational period. This section provides an overview of the stack profile analyses of H.

Reactive domain

The range of H's musical behaviours in the reactive domain occurred from R2 – R5 in terms one and two to R3 – R5 in term three. The concentration levels also moved from scattering between R2 – R5 in term one towards R3 – R5 in term two, and then increasingly concentrated between R4 – R5, especially in R5 in term three.

Overall, the distribution pattern over time showed that H's musical behaviours in the reactive domain in term one occurred mostly between R2 and R5, focused largely on R3 for five weeks and R4 and R5 for two weeks. In term two, H's musical behaviours located mostly between R2 and R5, focused largely on R3 for four weeks, R4 for three weeks and R5 for three weeks. In term three, H's musical behaviours ranged from R3 to R5, largely concentrated on R4 for three weeks and R5 for nine weeks (see Fig. 10.2). There were some gradual changes and it progressed towards more complex musical

behaviours with increasing relative frequency from terms one to three.

Proactive domain

Fig. 10.3 illustrated the range of H's musical development in the proactive domain. The range of H's musical behaviours occurred between P2 – P5 in term one and narrowed to P3 – P5 in terms two and three. Musical engagement largely focused between P2 – P4 in term one, P3 – P5 in term two, and narrowed down to P4 – P5 in term three.

Overall, the distribution pattern over time showed that H's musical behaviours in the proactive domain occurred mostly between P2 to P5, centered around P3 for five weeks and P4 for three weeks in term one. In term two, the range became narrower to P3 to P5, focused on P3 for five weeks and P4 for three weeks. In term three, the range stayed between P3 to P5, with most activities moved up to more complex musical behaviours in P4 for eight weeks and P5 for seven weeks (see Fig. 10.3). It progressed towards more complex musical behaviours like P4 and P5 with much larger number of weeks in term three than terms one and two.

Interactive domain

Concerning the range of the observed musical behaviours in the interactive domain (see Fig. 10.4), the range of H's musical behaviours occurred between I2 – I5 in term one and narrowed to I3 – I5 in terms two and three. H's musical behaviours focused between I2 – I4 in term one, I3 – I5 in term two, and narrowed down to I4 – I5 in term three.

Overall, the distribution pattern over time for H's musical behaviours in the interactive domain showed that the range was mainly between I2 to I5, focused on I3 for four weeks and I4 for three weeks in term one. In term two, the range was between I3 to I5, focused on I3 for three weeks and I4 for four weeks. In term three, the range was between I3 to I5, with more activities moved towards more complex musical behaviours at I4 for seven weeks and I5 for five weeks (see Fig. 10.4). It progressed towards more complex musical behaviours at P4 and P5 with more number of weeks in term three than previous terms.

School term		01/Spring term							02/Summer term								03/Autumn term											
	WK	2	3	4	6	7	11	12	14	15	16	18	19	20	21	22	24	25	26	27	28	30	32	33	34	35	37	38
R	R1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	R2	43	0	0	13	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	R3	14	43	58	25	100	33	67	0	0	17	13	100	78	38	43	11	11	11	17	0	0	0	0	0	0	0	0
	R4	43	29	17	25	0	33	33	64	46	25	88	0	0	38	14	78	28	56	33	57	0	40	0	38	43	0	0
	R5	0	29	25	38	0	33	0	36	54	58	0	0	11	25	43	11	61	33	50	43	100	60	100	63	57	100	100
	R6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 10.2 Stack profile of H in the reactive domain over 13 months

School term		01/Spring term							02/Summer term								03/Autumn term											
	WK	2	3	4	6	7	11	12	14	15	16	18	19	20	21	22	24	25	26	27	28	30	32	33	34	35	37	38
P	P1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	P2	38	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	P3	25	63	75	33	100	33	88	33	23	18	100	100	83	75	43	17	18	33	0	14	33	0	0	0	13	0	0
	P4	38	13	25	33	0	42	13	42	62	55	0	0	0	13	14	83	29	33	67	43	33	75	0	67	50	0	0
	P5	0	25	0	22	0	25	0	25	15	27	0	0	17	13	43	0	53	33	33	43	33	25	100	33	38	100	100
	P6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 10.3 Stack profile of H in the proactive domain over 13 months

School term		01/Spring term							02/Summer term								03/Autumn term											
I	WK	2	3	4	6	7	11	12	14	15	16	18	19	20	21	22	24	25	26	27	28	30	32	33	34	35	37	38
	I1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	I2	29	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	I3	29	57	82	40	0	42	100	17	9	13	100	100	0	67	33	13	27	22	0	0	0	17	0	0	14	0	0
	I4	43	43	18	60	0	42	0	83	82	63	0	0	75	33	17	88	27	67	33	86	50	83	0	83	86	0	0
	I5	0	0	0	0	0	17	0	0	9	25	0	0	25	0	50	0	47	11	67	14	50	0	0	17	0	100	100
	I6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 10.4 Stack profile of H in the interactive domain over 13 months

Overall, the range either stayed the same in terms one and two (R2 to R5) in the reactive domain and became narrower towards more complex musical behaviours in term three (R3 to R5), or became narrower towards more complex musical behaviours in terms two and three in proactive (P3 to P5) and interactive domains (I3 to I5). The relative concentration level moved gradually towards more complex musical behaviours from term one to term three. Simpler musical behaviours' frequency decreased and the higher level musical behaviours' frequency such as level 4 and 5 increased across all three domains over the 13 months.

10.4.2 Weekly weighted average level analyses

This section looks at the weekly weighted average level within each domain to provide additional analytical perspectives for the data analyses. For the working assumption and the usefulness of the weekly weighted average level, see section 8.5.2.

Table 10.4 provides the summary for each week, both concerning the three individual domains and the overall musical development level based on the data from the frequency distribution table for each week (see Chapter 6).

Table 10.4 Weekly weighted average levels of H

WK	R	P	I	Average
2	3.0	3.0	3.1	3.0
3	3.9	3.6	3.4	3.6
4	3.7	3.3	3.2	3.4
6	3.9	3.7	3.6	3.7
7	3.0	3.0	2.0	2.7
11	4.0	3.9	3.8	3.9
12	3.3	3.1	3.0	3.2
14	4.4	3.9	3.8	4.0
15	4.5	3.9	4.0	4.2
16	4.4	4.1	4.1	4.2
18	3.9	3.0	3.0	3.3
19	3.0	3.0	3.0	3.0
20	3.1	3.3	4.3	3.6
21	3.9	3.4	3.3	3.5
22	4.0	4.0	4.2	4.1
24	4.0	3.8	3.9	3.9
25	4.5	4.4	4.2	4.4
26	4.2	4.0	3.9	4.0
27	4.3	4.3	4.7	4.4
28	4.4	4.3	4.1	4.3
30	5.0	4.0	4.5	4.5
32	4.6	4.3	3.8	4.2
33	5.0	5.0	N/A	5.0
34	4.6	4.3	4.2	4.4
35	4.6	4.3	3.9	4.2
37	5.0	5.0	5.0	5.0
38	5.0	5.0	5.0	5.0

To further facilitate the analyses, the following figures (Fig. 10.5 to 10.9) used the data from Table 10.4 to show H's musical development trajectories over 13 months, both along the different domains and for the overall level. Each point in the figures refers to the weekly average level, either for the individual domains or for the overall musical development level.

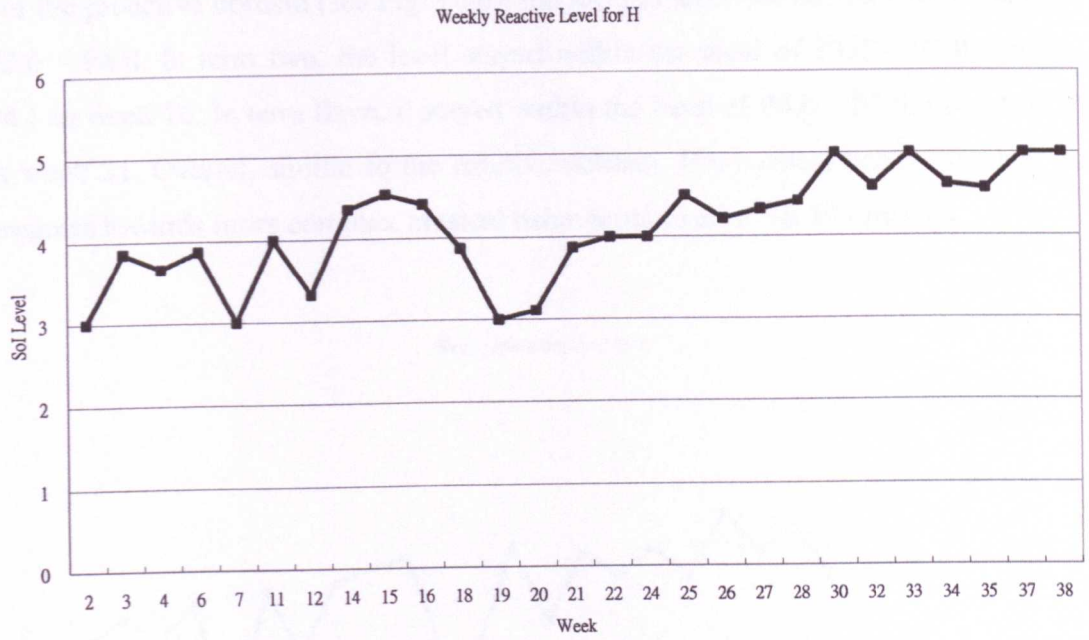


Fig. 10.5 Weekly weighted average levels of H in the reactive domain

Fig. 10.5 shows that in term one (weeks 2 to 12), H's reactive levels stayed within the band of R3.0 – R4.0. In term two (weeks 14 to 22), the levels stayed within the band of R3.0 – R5.0. After the school summer break, in term three (weeks 24 to 38) the level stayed within the band of R4.0 – R5.0. From week 19 onward, there was a general progress towards more complex musical behaviours.

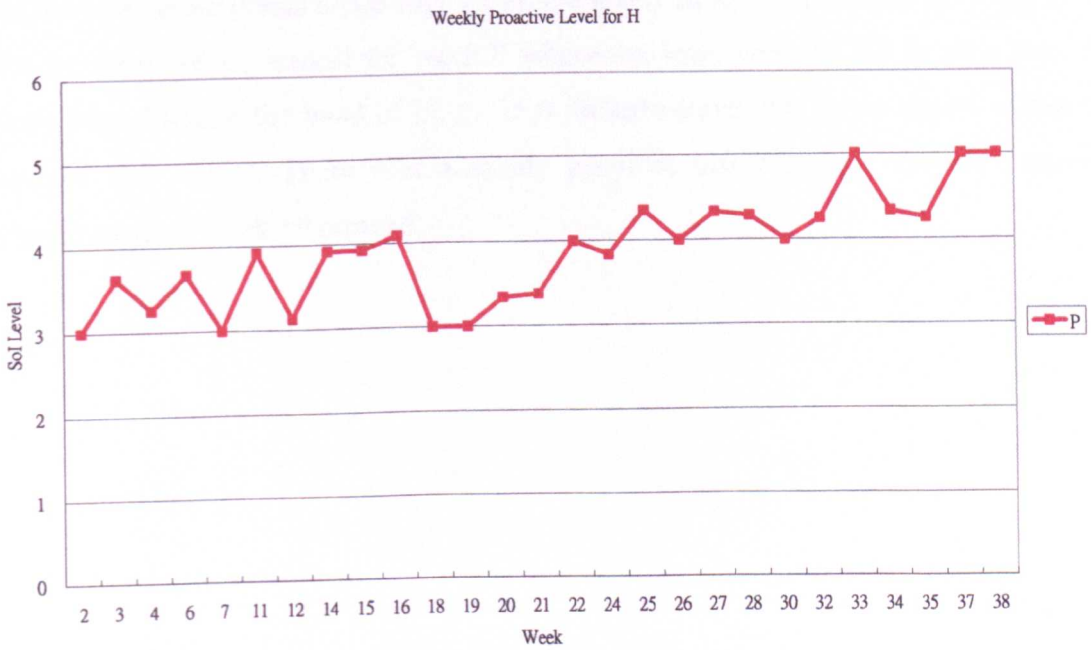


Fig. 10.6 Weekly weighted average levels of H in the proactive domain

For the proactive domain (see Fig. 10.6), the level in term one stayed within the band of P3.0 – P4.0. In term two, the level stayed within the band of P3.0 – P4.0, except for P4.1 in week 16. In term three, it stayed within the band of P4.0 – P5.0, except for P3.8 in week 24. Overall, similar to the reactive domain, H's musical behaviours had made progress towards more complex musical behaviours from week 19 onwards.

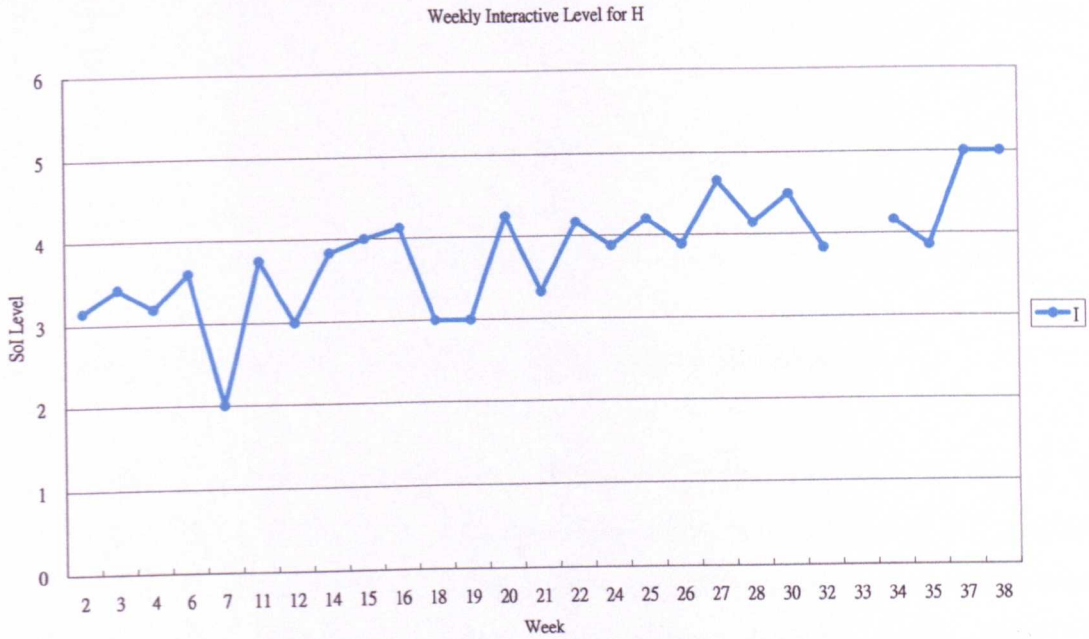


Fig. 10.7 Weekly weighted average levels of H in the interactive domain

For the interactive domain (see Fig. 10.7), the levels in term one stayed between I3.0 – I4.0 for most weeks, except for week 7 where the level was at I2.0. In term two, the levels stayed within the band of I3.0 – I5.0. In term three, the levels stayed within the band of I3.0 – I5.0. There was a steady progress towards more complex musical behaviours from week 19 onward.

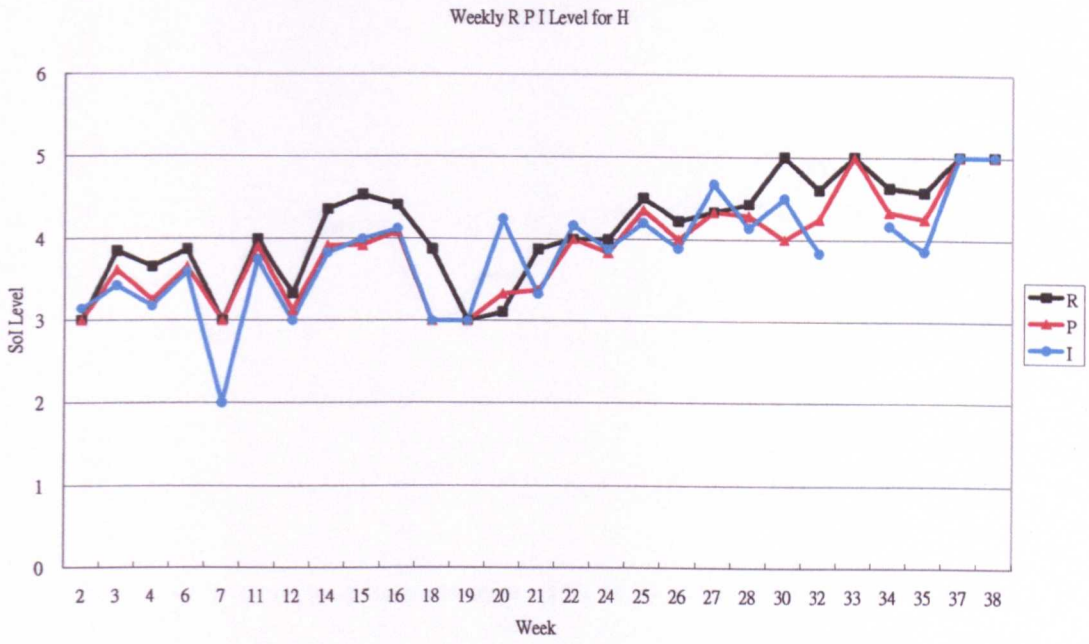


Fig. 10.8 Weekly weighted average levels of H in the three domains

In Fig. 10.8, all three domains are presented together in order to give a more comprehensive picture of H's average musical behaviours during the period of fieldwork observation. These domains seemed to move roughly in the same manner, with the reactive level higher than the proactive and interactive levels. The musical behaviours in all three domains remained within the band between levels 3 and 4 in term one, except for week 7 in interactive domain which went down to I2.0. In term two, these levels started to move up and stayed within the band between levels 3 and 5. In term three, these levels started to increase again and most of them stayed within the band between levels 4 and 5. It can be seen that H's musical developmental levels moved gradually towards a more complex musical behaviours across all domains from term one to term three.

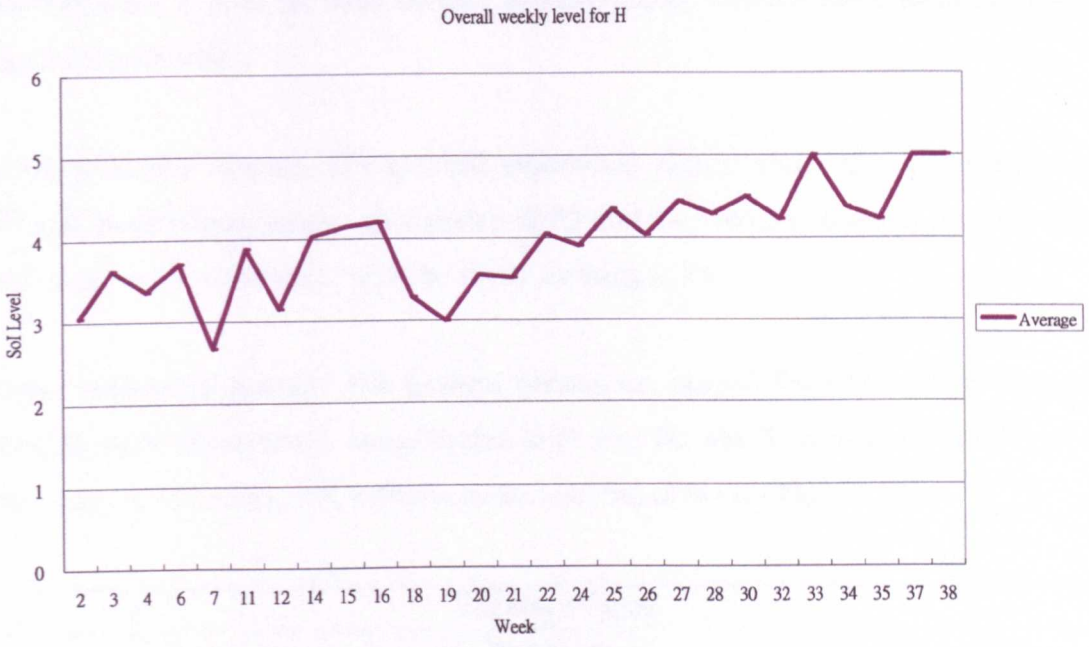


Fig. 10.9 Weekly overall weighted average levels of H

Overall summary from weekly level analyses

In summary, the weekly weighted average level analyses presented above showed that H's musical development levels moved gradually towards more complex musical behaviours from term one to term three. This musical development pattern can also be seen on the overall weekly level in Fig. 10.9. It showed that the trajectory moved mostly between levels 3 to 4 in term one, and it moved between levels 3 to 5 in term two. In term three, most of the levels were within the band of levels 4 to 5. The music behaviours showed gradual development across all three domains in the overall musical development level from terms one to three.

10.5 Concentric and stack profiles of H for three terms

This section presents another perspective showing H's musical development over 13 months, based on summarising termly data rather than weekly analyses. The termly profiles are produced by aggregating the weekly data within each term across the three domains. This procedure raised the analytical level from weekly to termly level.

Term one

Fig. 10.10 shows that H's musical behaviours ranged from R2 – R5 in the reactive domain in term one. Overall, most observations occurred at R3 and R4, which

accounted for 72% of the total number of occurrence, with the mode locating at R3 in the reactive domain.

In the proactive domain, H's musical behaviours ranged from P2 – P5 in term one. Overall, most observations concentrated at P3 and P4, which accounted for 81% of the total number of occurrence, with the mode locating at P3.

In the interactive domain, H's musical behaviours ranged from I2 – I5 in term one. Overall, most observations concentrated at I3 and I4, which accounted for 89% of the total number of occurrence, with the mode locating at I3 (see Fig. 10.10).

Termly Profile								
Term one								
Domain	**Freq**	**%**	**Domain**	**Freq**	**%**	**Domain**	**Freq**	**%**
R1	0	0	P1	0	0	I1	0	0
R2	4	7	P2	4	7	I2	4	8
R3	25	44	P3	32	54	I3	30	58
R4	16	28	P4	16	27	I4	16	31
R5	12	21	P5	7	12	I5	2	4
R6	0	0	P6	0	0	I6	0	0
Total	57	100	Total	59	100	Total	52	100

Fig. 10.10 Stack profile of H in term one

Based on the assessment procedure in Chapter 6, Fig. 10.11, which is a concentric profile, illustrates H's musical development mapping in term one.

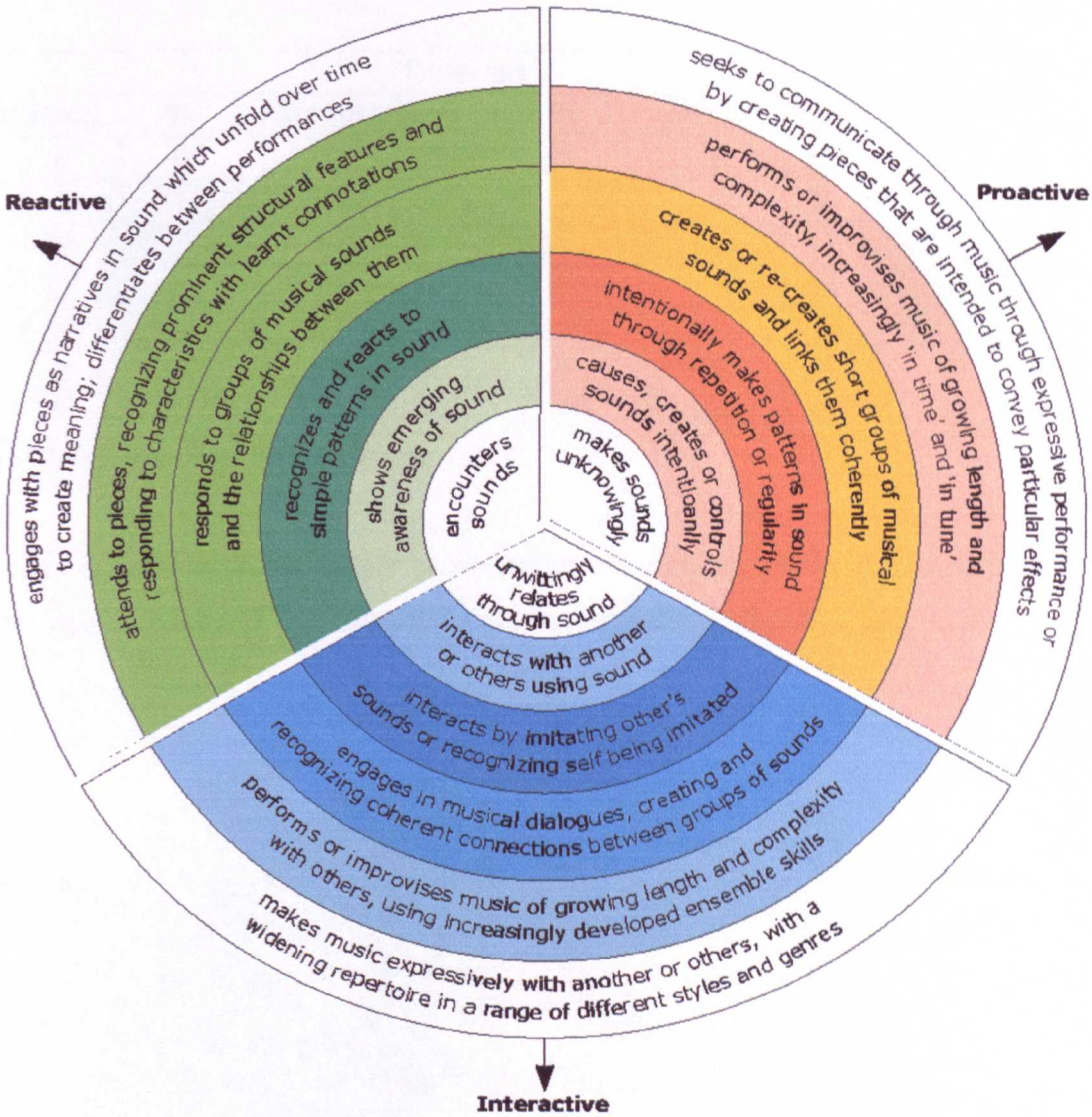


Fig. 10.11 Concentric profile of H in term one

Term two

In the reactive domain (see Fig. 10.12), H's musical behaviours ranged from R2 – R5 in term two. Overall, most observations occurred at R3 and R4, which accounted for 67% of the total number of occurrence, with the mode locating at R4.

In the proactive domain, H's musical behaviours ranged from P3 – P5 in term two. Overall, most observations concentrated at P3 and P4, which accounted for 83% of the total number of occurrence, with the mode locating at P3.

In the interactive domain, H's musical behaviours ranged from I3 – I5 in term two. Overall, most observations occurred at I3 and I4, which accounted for 83% of the total

number of occurrence, with the mode locating at I4 (see Fig. 10.12).

Term two								
Domain	**Freq**	**%**	**Domain**	**Freq**	**%**	**Domain**	**Freq**	**%**
R1	0	0	P1	0	0	I1	0	0
R2	1	1	P2	0	0	I2	0	0
R3	25	32	P3	41	55	I3	11	26
R4	27	35	P4	21	28	I4	24	57
R5	24	31	P5	13	17	I5	7	17
R6	0	0	P6	0	0	I6	0	0
Total	77	100	Total	75	100	Total	42	100

Fig. 10.12 Stack profile of H in term two

We can use a termly concentric profile to summarise the analyses above. The concentric profile in Fig. 10.13 illustrates H's musical development mapping in term two.

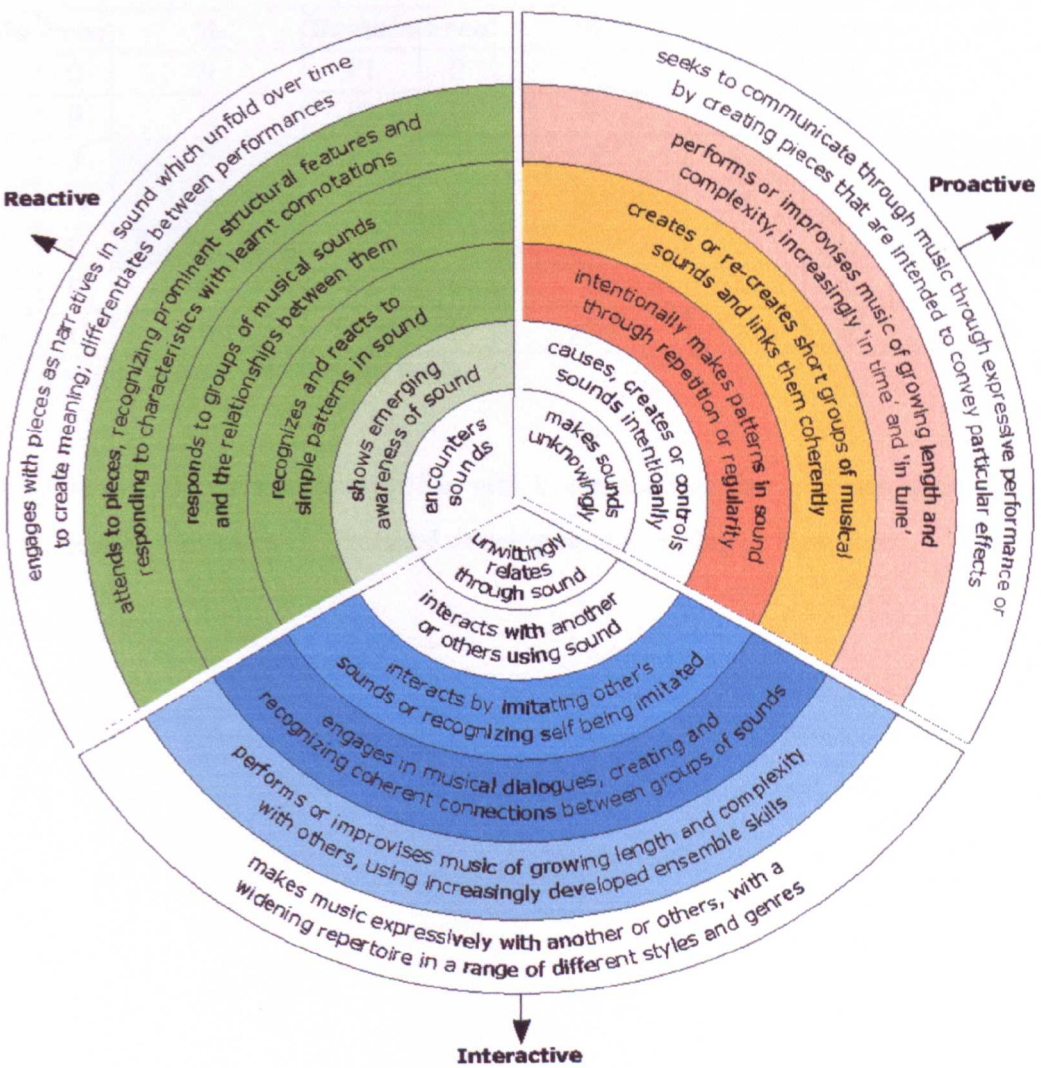


Fig. 10.13 Concentric profile of H in term two

Term three

In the reactive domain (see Fig. 10.14), H's musical behaviours ranged from R3 – R5 in term three. Overall, most observations occurred at R4 and R5, which accounted for 94% of the total number of occurrence, with the concentration locating at R5.

In the proactive domain, H's musical behaviours ranged from P3 – P5 in term three. Overall, most observations occurred at P4 and P5, which accounted for 88% of the total number of occurrence, with the concentration locating at P4.

In the interactive domain, H's musical behaviours ranged from I3 – I5 in term three. Overall, most observations occurred at I4 and I5, which accounted for 89% of the total number of occurrence, with the mode locating at I4 (see Fig. 10.14).

Term three								
Domain	**Freq**	**%**	**Domain**	**Freq**	**%**	**Domain**	**Freq**	**%**
R1	0	0	P1	0	0	I1	0	0
R2	0	0	P2	0	0	I2	0	0
R3	5	6	P3	10	12	I3	9	12
R4	33	39	P4	37	46	I4	46	61
R5	47	55	P5	34	42	I5	21	28
R6	0	0	P6	0	0	I6	0	0
Total	85	100	Total	81	100	Total	76	100

Fig. 10.14 Stack profile of H in term three

Fig. 10.15 is a termly concentric profile which summarises the analyses above. This concentric profile illustrates H's musical development mapping in term three.

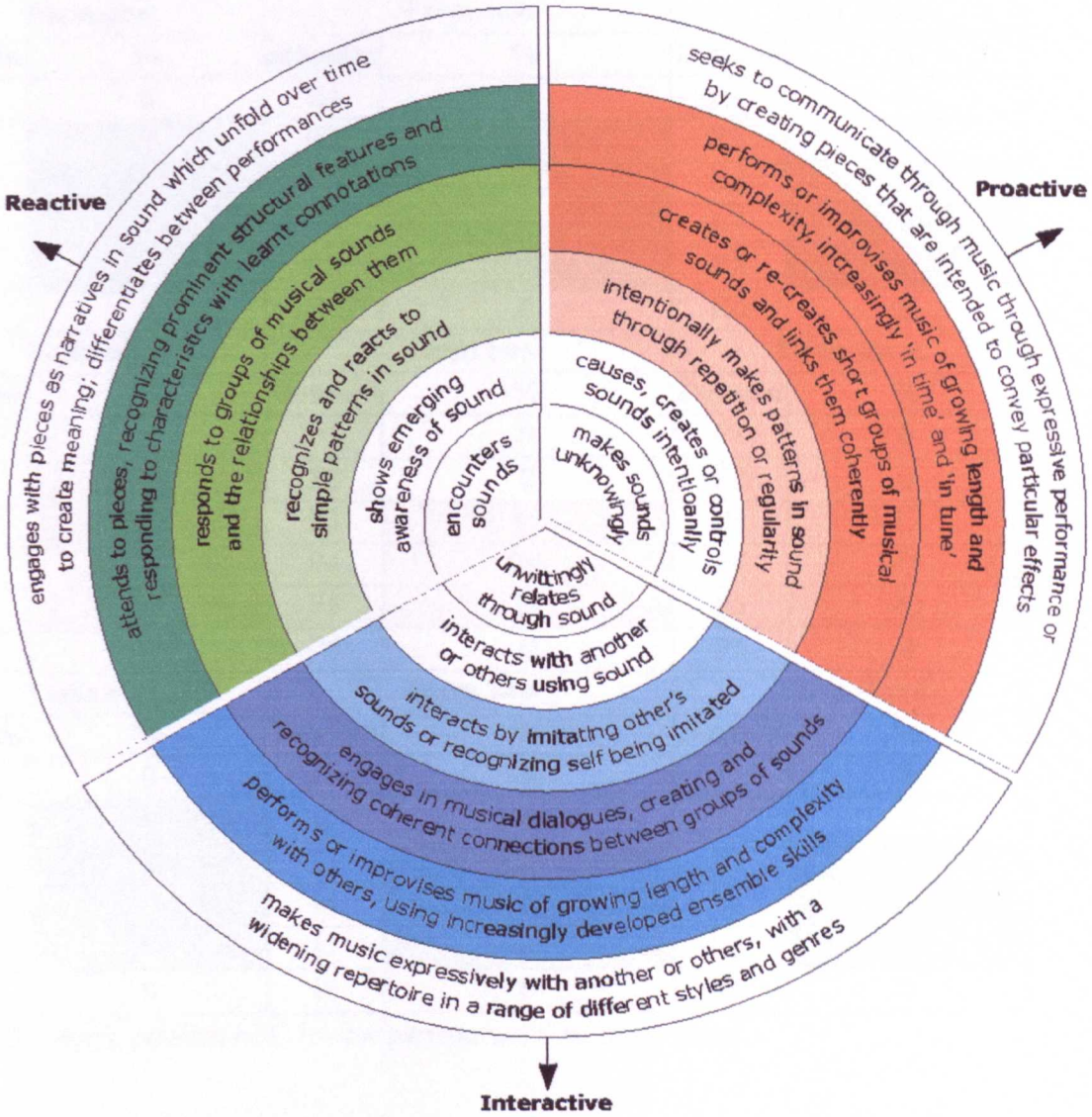


Fig. 10.15 Concentric profile of H in term three

Termly comparison and analyses

Fig. 10.16 provides further investigation of the musical development changes between terms one, two and three of H's musical development mapping. By putting three termly stack profiles together, it offers an easier comparison of the musical development changes between the three terms.

Termly Profile Chart 2					
Term one		Term two		Term three	
Domain	%	Domain	%	Domain	%
R1	0	R1	0	R1	0
R2	7	R2	1	R2	0
R3	44	R3	32	R3	6
R4	28	R4	35	R4	39
R5	21	R5	31	R5	55
R6	0	R6	0	R6	0
Term one		Term two		Term three	
Domain	%	Domain	%	Domain	%
P1	0	P1	0	P1	0
P2	7	P2	0	P2	0
P3	54	P3	55	P3	12
P4	27	P4	28	P4	46
P5	12	P5	17	P5	42
P6	0	P6	0	P6	0
Term one		Term two		Term three	
Domain	%	Domain	%	Domain	%
I1	0	I1	0	I1	0
I2	8	I2	0	I2	0
I3	58	I3	26	I3	12
I4	31	I4	57	I4	61
I5	4	I5	17	I5	28
I6	0	I6	0	I6	0

Fig. 10.16 Stack profiles of H in comparison with the three terms

In comparing H's musical development in terms one, two, and three through Fig. 10.16, there were natural changes across all three domains. In the reactive domain, the range converged from terms one and two between R2 – R5 to higher levels between R3 – R5 in term three. The mode moved from R3 in term one, R4 in term two and R5 in term three. For the simpler musical behaviours like R1 and R2, term one had 7%, term two had 1% and term three had 0%. For the concentration pattern, the concentration structure increased significantly towards more complex musical behaviours at levels 4 and 5 (94%) in term three, compared with term one (49%) and two (66%). It appeared that H's musical behaviours in the reactive domain progressed from term one to term three, which showed in the mode, range and the concentration pattern.

In the proactive domain, the range converged to higher levels, between P2 – P5 in term one to P3 to P5 in terms two and three. The mode moved from P3 in terms one and two

to P4 in term three. In this domain, it appeared that the musical behaviours was similar across terms one and two but with less simple musical behaviours levels, e.g. level 2, in term two. Similarly, the concentration structure of most observations occurred at P3 and P4, with 81% in term one and 83% in term two. However, the concentration structure in term three increased to P4 and P5 (88%). This showed that the concentration structure moved towards more complex musical behaviours in term three and increased significantly its percentage of the total number of occurrence at more complex musical behaviours at level 4 and 5 compared with term one (38%) and two (32%).

In the interactive domain, the range converged to higher levels, from I2 – I5 in term one to I3 – I5 in terms two and three. The mode moved from I3 in term one to I4 in terms two and three. Most observations occurred at I3 and I4, with 89% in term one, I3 and I4 for 83% in term two and I4 and I5 for 89% in term three. The concentration structure for more complex musical behaviours like I4 and I5 also increased in term three, compared with term one of 35% and term two of 74%. It appeared that H's musical behaviours in the interactive domain progressed from term one to term three which showed in the mode, range and the concentration pattern.

Overall, the pattern of distribution analyses based on Fig. 10.16 showed that across all three domains, H's observed musical behaviours trended towards more complex musical behaviours. The range converged to higher levels of development, and the overall concentration structure moved towards higher levels from term one to term three. There was similarity from term one to term two in the proactive domain, but it showed progress in term three. The comparison between the three concentric profiles also offered similar illustrations of H's musical development from term one to term three. The concentric profiles demonstrated an outward moving tendency from simple to more complex musical behaviours of H across all three domains over the 13 months.

10.6 Summary

This chapter presented the detailed longitudinal case study analyses of H as an illustration of the musical behaviours and development of a young person with complex needs. The analyses looked into weekly musical behaviours of H over 13 months, and H's musical development was divided into three sequential school terms. Through using the newly developed assessment procedure in Chapter 6, detailed analyses were provided through comments concerning weekly musical behaviours, weekly musical development analyses and termly analyses, with relevant weighted average level analyses, and stack and concentric profiles to illustrate H's musical development over the observational period.

Overall, the analyses showed that across all three domains, H's observed musical development trended towards more complex musical behaviours. The concentric profiles also demonstrated an outward moving tendency from simple to more complex musical behaviours of H across all three domains over the three school terms.

Chapter 11

Discussion

11.1 Introduction

This chapter acts as a bridging chapter – linking the main research findings to further discussion, critique and future research suggestions. The chapter is organised into the following sections:

Section 11.2 provides a supplementary summary of the three cases which have been presented in the previous chapters, giving further analyses and comparison, from both time series and cross-sectional perspectives of the students' musical behaviours and development.

Section 11.3 provides a list of preliminary explanatory factors which could explain the reasons for these students' simpler or more complex musical behaviours. The references to relevant literature are also provided.

Section 11.4 offers some critiques of several aspects of the *SoI* framework, including both theoretical and operational perspectives. The limitation of using the case study approach in this research will also be discussed. This section also gives suggestions for further research which mainly follow each discussion of the critiques. These suggestions call for more research on the music for children and young people with complex needs.

Finally, section 11.5 is the summary of this chapter.

11.2 Summary of the three case studies

In this section, the three case studies from Chapters 8 to 10 are brought together to provide a brief summary of their individual musical behaviours and development over a period of eight to 13 months. The case comparison (Neuman, 2006, p. 458) will also be drawn, focusing on the pattern similarities and differences between the students. Before looking at the summary of the students' musical behaviours, a review of their

background information is provided (see Table 11.1).

Table 11.1 Summary of the basic background information of the three students

Case study	J	K	H
Age	11	18	18
Gender	Male	Female	Male
Ethnicity and mother tongue	Black Caribbean/English	Indian/Hindi	Bangladeshi /Bengali
Verbal/non – verbal	Verbal for a few single words	Non-verbal	Verbal for a few single words
Main communicational means	Uses vocalisation; gesture; body language; touch and facial expression to communicate	Uses eye contact, vocalisation, body language, touch, eye pointing and facial expression to communicate.	Uses eye contact; gesture; vocalisation; one-word sentences, body language; touch; eye pointing; and facial expression to communicate.
Wheelchair user	Yes	Yes	Yes
Disabilities	Visual impairment, cerebral palsy, epilepsy, severe learning difficulties (SLD), physical disability and speech, language and communication difficulty.	Cerebral palsy, developmental delay, Profound and Multiple Learning Difficulties (PMLD), severe physical and learning disability, feeding difficulties, microcephaly, divergent squint and epilepsy.	Severe learning difficulties (SLD) and complex medical problems.
Observational period	8 months	13 months	13 months

11.2.1 Overall cross-case comparison based on the termly stack and concentric profiles

In order to compare the three case studies, the researcher has reorganised J's musical behaviours into two sequential school terms, so that the cross-case comparison can be made more easily. For J's observational period, there were only two school terms in total.

Time series comparison

This part presents the time series comparison of the three students' musical behaviours over eight to 13 months. The materials are drawn from the previous three case study chapters.

For J, the mode of the three domains moved from R4 to R5 and from P3 to P5 from terms one to two, whereas interactive behaviours remained at I4 but with increased

relative occurrence in term two. The range of J's musical behaviours stayed more or less the same in the proactive and interactive domains while relative concentration levels focused on more complex musical behaviours in term two compared to those during term one in the three domains (see Fig. 11.1). When looking at the concentric profiles over time, Fig. 11.2 also shows that the concentration of J's musical behaviours moved apparently towards outer circles from terms one to two, particularly within the reactive and proactive domains.

For H, the modes of the three domains from terms one to three moved from R3, R4 to R5, from P3 in terms one and two to P4 in term three, and from I3 in term one to I4 in terms two and three, with much improved relative occurrence at I4 in term three (see Fig. 11.1). Fig. 11.2 also shows that the concentration of H's musical behaviours moved towards outer circles from terms one to three. The range of H's musical behaviours narrowed down and the relative concentration moved gradually towards more complex musical behaviours levels in all three domains from terms one to three with increased occurrences.

K, who had PMLD, did not exhibit as much progress in the reactive, proactive, and interactive domains as J and H, who had SLD (see Fig. 11.1 and 11.2). For K, the modes of the three domains from terms one to three moved from R4 to R3 and back to R4 – with increased relative occurrence in term three, from P4 to P1 and back to P4 – with increased concentration and development depth in term three, and from I2 in terms one and two to I4 in term three. Fig. 11.1 shows that K's musical behaviours regressed from terms one to two but progressed from terms two to three. However, over the whole observational period, the range of K's musical behaviours became less scattered and focused on more complex musical behaviours in term three than in term one, especially for the reactive and interactive domains. The relative concentration level also moved towards more complex musical behaviours with increased occurrences in term three than in terms one and two.

Case J			
Term 1		Term 2	
Domain	%	Domain	%
R1	1	R1	0
R2	6	R2	0
R3	22	R3	16
R4	47	R4	29
R5	25	R5	56
R6	0	R6	0
Domain	%	Domain	%
P1	4	P1	14
P2	11	P2	1
P3	34	P3	14
P4	32	P4	23
P5	20	P5	47
P6	0	P6	0
Domain	%	Domain	%
I1	0	I1	0
I2	23	I2	14
I3	10	I3	1
I4	52	I4	64
I5	15	I5	21
I6	0	I6	0

Case H					
Term 1		Term 2		Term 3	
Domain	%	Domain	%	Domain	%
R1	0	R1	0	R1	0
R2	7	R2	1	R2	0
R3	44	R3	32	R3	6
R4	28	R4	35	R4	39
R5	21	R5	31	R5	55
R6	0	R6	0	R6	0
Domain	%	Domain	%	Domain	%
P1	0	P1	0	P1	0
P2	7	P2	0	P2	0
P3	54	P3	55	P3	12
P4	27	P4	28	P4	46
P5	12	P5	17	P5	42
P6	0	P6	0	P6	0
Domain	%	Domain	%	Domain	%
I1	0	I1	0	I1	0
I2	8	I2	0	I2	0
I3	58	I3	26	I3	12
I4	31	I4	57	I4	61
I5	4	I5	17	I5	28
I6	0	I6	0	I6	0

Case K					
Term 1		Term 2		Term 3	
Domain	%	Domain	%	Domain	%
R1	7	R1	3	R1	0
R2	14	R2	12	R2	7
R3	27	R3	43	R3	12
R4	41	R4	29	R4	53
R5	11	R5	13	R5	28
R6	0	R6	0	R6	0
Domain	%	Domain	%	Domain	%
P1	10	P1	32	P1	8
P2	24	P2	13	P2	8
P3	28	P3	23	P3	15
P4	30	P4	25	P4	50
P5	8	P5	7	P5	20
P6	0	P6	0	P6	0
Domain	%	Domain	%	Domain	%
I1	16	I1	13	I1	0
I2	36	I2	43	I2	21
I3	10	I3	8	I3	0
I4	33	I4	30	I4	68
I5	4	I5	6	I5	12
I6	0	I6	0	I6	0

Fig. 11.1 Summary of termly stack profiles of J, H and K

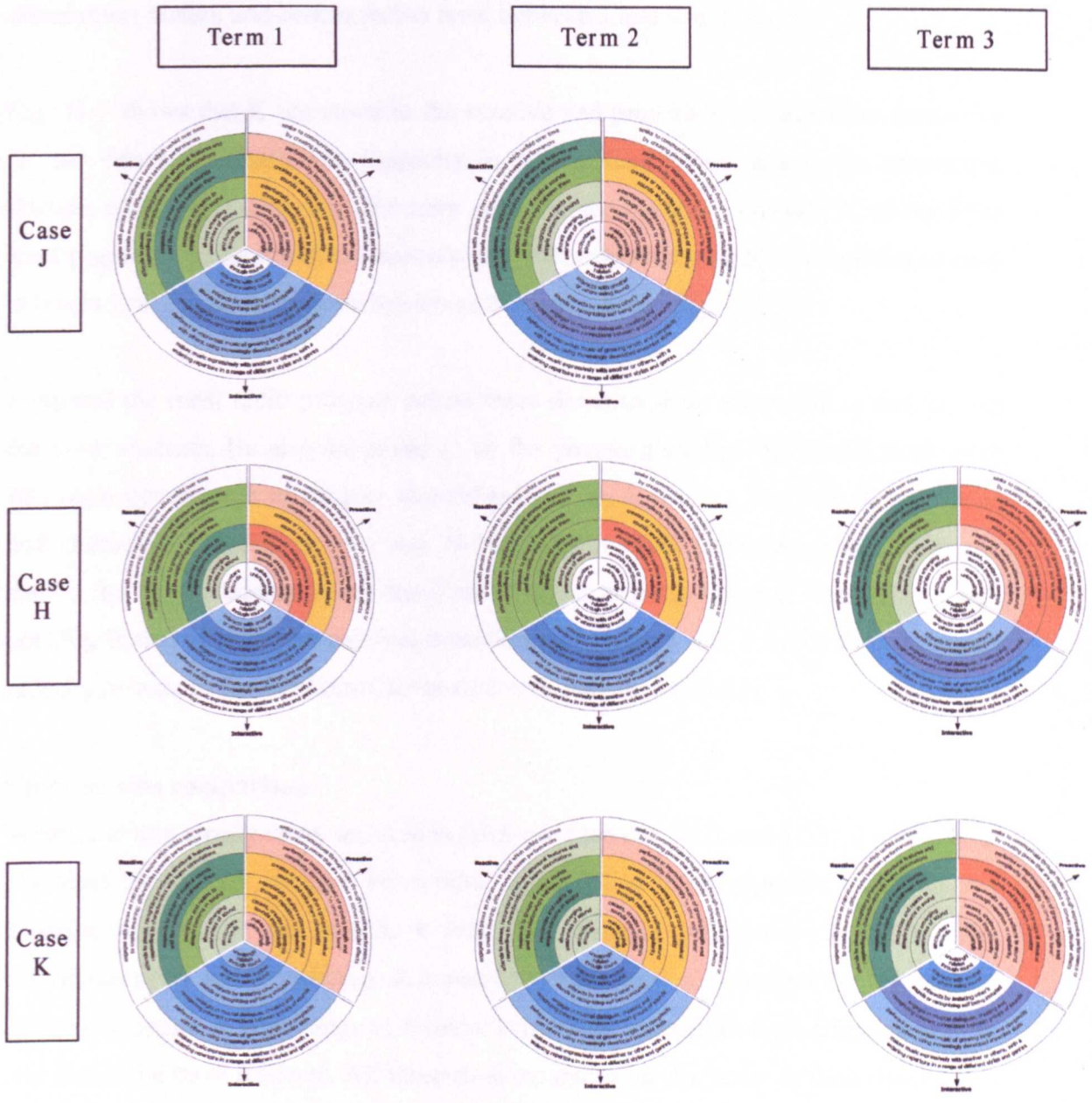


Fig. 11.2 Overview of termly concentric profiles of J, H and K

When comparing these three students from a time series perspective, through their stack and concentric profiles, it was found that under structured music education they all showed progress in their musical behaviours, over the two terms for J and three terms for H and K. J and H, who had SLD, seemed to make more obvious progress over a period of time than K did, despite their age differences. The concentration pattern of their musical behaviours moved towards outer circles in the reactive and proactive domains with increased relative occurrence in I4 and I5 in their last term. Fig. 11.2 shows some similarities in the concentration levels and distribution patterns in the three domains between J's concentric profile in term two and H's concentric profile in term

three. They both reached R5, P5 and I4. In addition, there were also similarities in the distribution pattern and concentration level between J and K in term one.

Fig. 11.1 shows that K regressed in the reactive and proactive domains from terms one to two. Moreover, there was inactivity in K's musical behaviours in the interactive domain when comparing the first term with the second term. Overall, K showed the least progress among the three students, and still exhibited simpler musical behaviours at levels 1 or 2 in all three domains across three terms (see Fig. 11.2).

J showed the most rapid progress across three domains from terms one to two among the three students. He also happened to be the youngest student. However, there were still some occurrences of simpler musical behaviours at levels 1 and 2 in the proactive and interactive domains in term two. H had the smoothest and more gradual progress among the three students across the three domains over three terms. One thing worth noticing is that H's simpler musical behaviours at levels 1 and 2 in the three domains reduced to none in the third term, compared with the other students.

Cross section comparison

When studying termly cross sections in term one (see Fig. 11.2 and 11.3), J and K both exhibited the simpler musical behaviours at level one in the reactive and proactive domains, whereas H did not have level one musical behaviours. J had musical behaviours at R1 and P1, whereas K appeared to have musical behaviours at level one in all three domains. A wide range of musical behaviours seemed to form a feature in term one across the three students. All three students indicated similarity in their distribution pattern in that they had fewer occurrences at levels 1 and 5 but concentrated more on the middle levels (levels 2 to 4) in the three domains.

In term two (see Fig. 11.2 and 11.3), J made more obvious progress than H and K. J and H both had less simple musical behaviours at levels 1 and 2 in the reactive and interactive domains compared with K in term two and with themselves in term one. J and K had the same range of musical behaviours in the proactive domain from P1 to P5 in term two, and K still exhibited simpler musical behaviours at P1 and P2 in term three, which might probably be due to the nature of the physical disabilities in both students. The main differences between J and the other two students in term two concerning their musical progress, might be due to the different music curriculum, teaching materials and

the launch of a special musical project.

In term three (see Fig. 11.2 and 11.3), both H and K showed progress in their concentric profiles with less simple musical behaviours for K in the reactive and interactive domains at level 1, and for H in all three domains at levels 1 and 2 in term three. H had more complex musical behaviours, at levels 4 and 5 across three domains, than K. This may be due to the nature of their learning difficulties. Among the three case studies, J and H both made progress and their musical behaviours moved towards a higher level (level 5) in the reactive and proactive domains, compared with K who made progress only to level 4. There were some similarities in that the three students all made progress and increased their relative concentration at level 4 in the interactive domain at the end of their observational period.

Term 1					
Case J		Case H		Case K	
Domain	%	Domain	%	Domain	%
R1	1	R1	0	R1	7
R2	6	R2	7	R2	14
R3	22	R3	44	R3	27
R4	47	R4	28	R4	41
R5	25	R5	21	R5	11
R6	0	R6	0	R6	0
Domain	%	Domain	%	Domain	%
P1	4	P1	0	P1	10
P2	11	P2	7	P2	24
P3	34	P3	54	P3	28
P4	32	P4	27	P4	30
P5	20	P5	12	P5	8
P6	0	P6	0	P6	0
Domain	%	Domain	%	Domain	%
I1	0	I1	0	I1	16
I2	23	I2	8	I2	36
I3	10	I3	58	I3	10
I4	52	I4	31	I4	33
I5	15	I5	4	I5	4
I6	0	I6	0	I6	0

Term 2					
Case J		Case H		Case K	
Domain	%	Domain	%	Domain	%
R1	0	R1	0	R1	3
R2	0	R2	1	R2	12
R3	16	R3	32	R3	43
R4	29	R4	35	R4	29
R5	56	R5	31	R5	13
R6	0	R6	0	R6	0
Domain	%	Domain	%	Domain	%
P1	14	P1	0	P1	32
P2	1	P2	0	P2	13
P3	14	P3	55	P3	23
P4	23	P4	28	P4	25
P5	47	P5	17	P5	7
P6	0	P6	0	P6	0
Domain	%	Domain	%	Domain	%
I1	0	I1	0	I1	13
I2	14	I2	0	I2	43
I3	1	I3	26	I3	8
I4	64	I4	57	I4	30
I5	21	I5	17	I5	6
I6	0	I6	0	I6	0

Term 3			
Case H		Case K	
Domain	%	Domain	%
R1	0	R1	0
R2	0	R2	7
R3	6	R3	12
R4	39	R4	53
R5	55	R5	28
R6	0	R6	0
Domain	%	Domain	%
P1	0	P1	8
P2	0	P2	8
P3	12	P3	15
P4	46	P4	50
P5	42	P5	20
P6	0	P6	0
Domain	%	Domain	%
I1	0	I1	0
I2	0	I2	21
I3	12	I3	0
I4	61	I4	68
I5	28	I5	12
I6	0	I6	0

Fig. 11.3 Cross-case comparison of termly analyses

Summary

Progress for children and young people with complex needs, as Marvin (1998) noted, 'does not always equate with climbing a ladder of developmental skills' (p. 125). Findings from the three case studies showed that progress, stasis and regression in their musical behaviours were all part of their learning process. Musical development for these students showed that both the progress and stasis were important that 'the possibility of achievement in a vertical dimension should not be overlooked but a broader more lateral concept of progress should be constructed' (Marvin, 1998, p. 125). Moreover, brief regression seemed to rebuild simpler musical skills in preparation for the more complex musical skills in the students' musical development, as seen in K.

11.2.2 Overall cross-case comparison based on the weekly weighted average levels

Apart from the previous stack and concentric profiles comparison, this section looks at the weekly weighted average level for the three case studies to provide another perspective for discussion. The comparison will mainly be based on the overall weekly weighted average level (see Fig. 11.7) between the three students. The level for individual domains (see Figs. 11.4 to 11.6) will also be used to complement the overall level comparison.

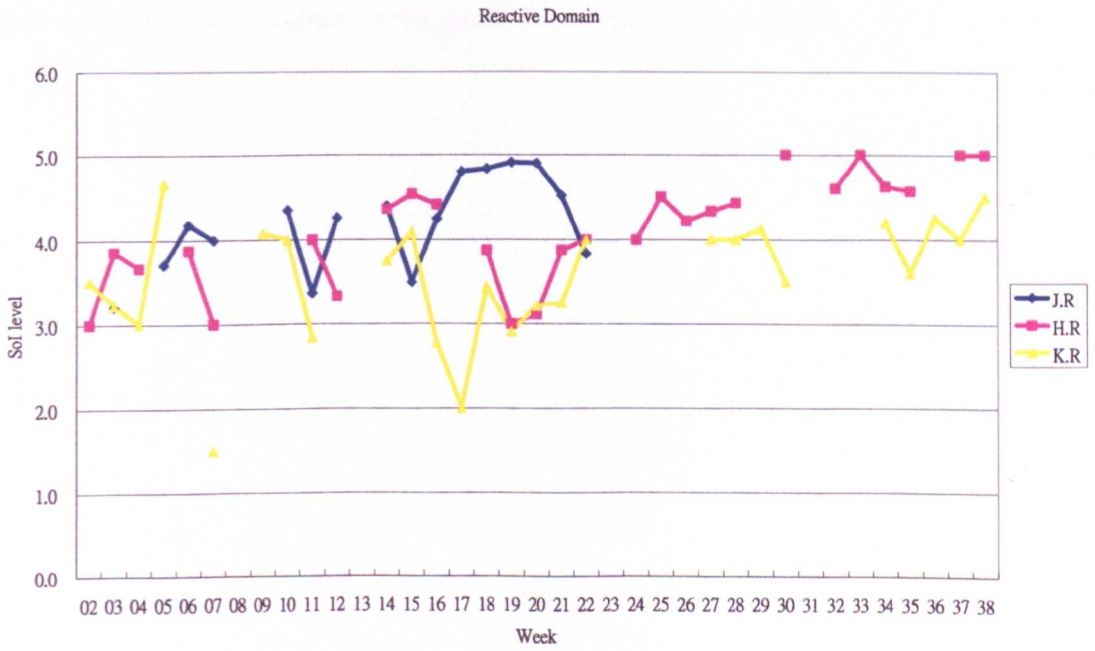


Fig. 11.4 Cross-case comparison of the reactive level

Fig. 11.4 shows that from weeks 16 to 21, J's musical behaviours in the reactive domain were generally higher than the other two students, and the three students all showed progress and moved towards more complex musical behaviours in the reactive domain.

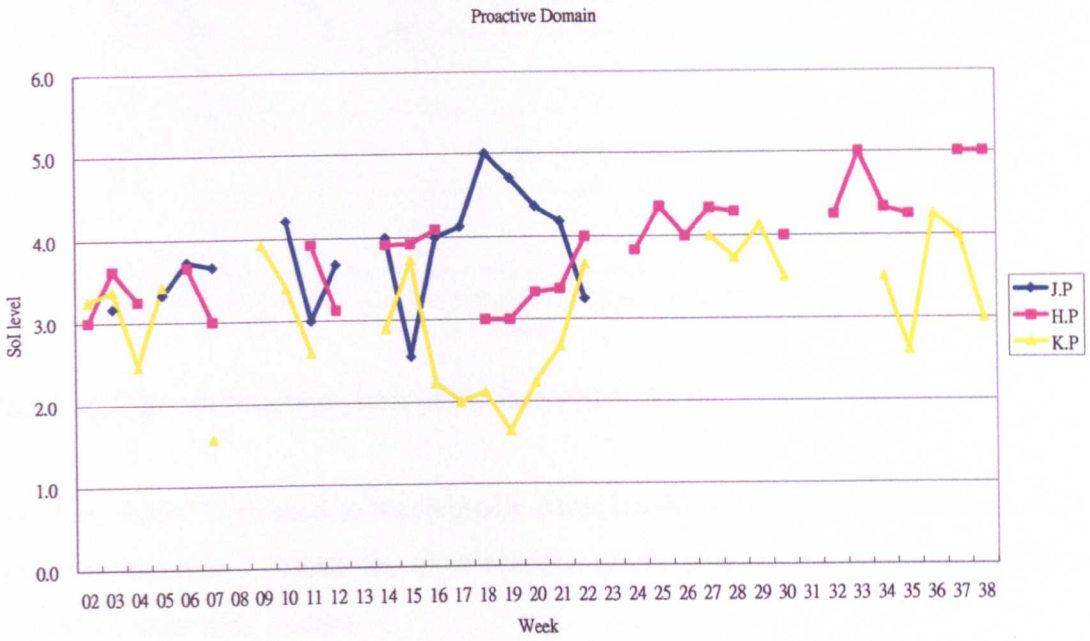


Fig. 11.5 Cross-case comparison of the proactive level

Fig. 11.5 shows that K had a much lower level than J and H's musical behaviours in the proactive domain. This may be due to the nature of her severe physical disabilities. H made more obvious progress in the proactive domain than J and K.

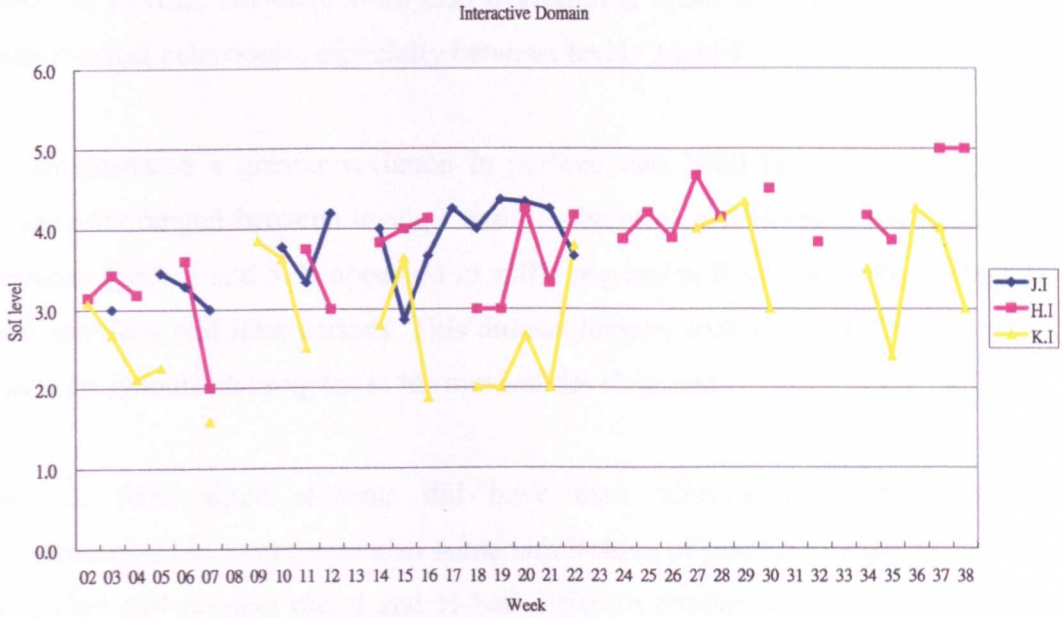


Fig. 11.6 Cross-case comparison of the interactive level

Fig. 11.6 shows K seemed to reach much lower levels in the interactive domain than the other two students. H made the most obvious music progress in the interactive domain among the three case studies.

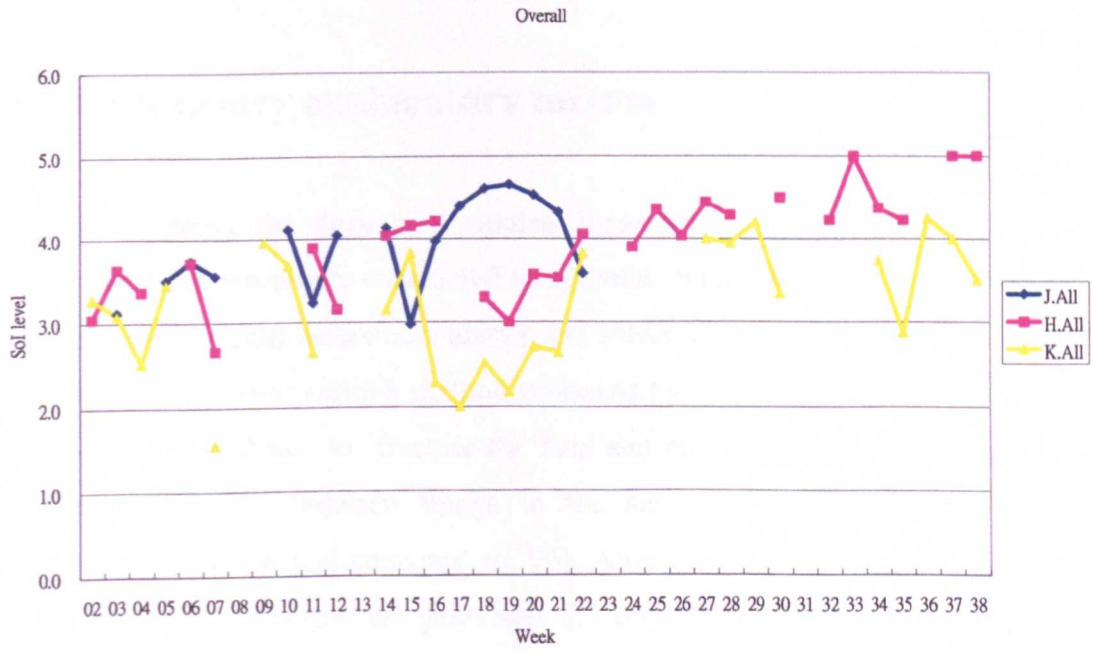


Fig 11.7 Cross-case comparison of an overall level

For overall musical behaviours, Fig. 11.7 shows that K's results were much lower than J and H. J and H, who have SLD, showed a better performance level in general than K,

who has PMLD, but there were also overlapping areas between the three students in their musical behaviours, especially between levels 3 and 4.

K demonstrated a greater variation in performance level than J and H. K's musical behaviours ranged between levels 1 and 5, whereas J and H had a more focused range between levels 3 and 5. K appeared to suffer regression from weeks 16 to 19, compared with previous and later periods. This did not happen with H and J. Over 13 months, H made the smoothest progress in his musical development.

Overall, these three students did have their idiosyncratic patterns of musical development, but there were also some similarities of pattern movement that could be identified and pointed out. J and H had different patterns of musical behaviours, but they stayed more or less in the same range from levels 3 to 5. The main difference between their patterns of progress was that J had a more apparent change and stayed within the band of higher levels 4 and 5 over five weeks (weeks 16 to 21), whereas H showed a more gradual progress and only became more stable at the higher levels 4 and 5 after week 22. Because J and H were in different music classes, their differences may be due to their idiosyncratic development patterns, individual difficulties and strengths, the music curriculum and peer relationships.

11.3 Preliminary explanatory factors

After investigating the three case studies, there are some hypothetical preliminary factors which the researcher considered as potential explanatory factors for simpler and more complex musical behaviours among the students in this research. The researcher utilised the qualitative research method proposed by Yin (2003b, p. 73) and Maxwell (2005) who stressed that to 'fracture the data and rearrange them into categories that facilitate comparison between things in the same category and that aid in the development of theoretical concepts' (p. 96). After the process of organising data into broader themes, the researcher generated the preliminary explanatory factors which might contribute to the students' musical behaviours.

These preliminary factors are considered by the researcher to be of potential explanatory power towards the students' musical behaviours. Many researchers (e.g. Hargreaves,

1996; Papoušek, 1996; Pouthas, 1996; Sloboda & Davidson, 1996; Austin *et al.*, 2006; Hallam, 2006) mentioned these factors under different contexts, backgrounds or in different areas of study. These contexts involved early musical development, instrumental learning, learning disability, or mainstream music education, which did not necessarily include music for children and young people who have complex needs.

Since the list is considered only preliminary in this research, the factors proposed will need to be further developed into a more coherent, comprehensive and systematic manner in future research, especially the relative strengths or importance of each factor and the interactions between factors. Further research can also investigate these explanatory factors to see whether there exists common ground between special music education and mainstream music education.

The research in this area will help the music practitioners with their teaching strategies and assist them to plan and deliver their music lessons. It will also enhance understanding of the nature of musical behaviours for children and young people with complex needs, and help them to maximise their potential.

These factors can be categorised as the student-related factors, the music teaching factors and the school environment factors. The student-related factors contain things that the children and young people bring to the music lesson such as enthusiasm and things that are related to them. The music teaching factors involve things that the teacher brings to the music lesson – such as the teacher's personality, teaching strategies – and the music curriculum. The school environment factors contain things that happen inside and outside the school which are part of the school curriculum together with the available resources that the school has, such as additional school staff, teaching resources and collaboration between the multidisciplinary team and other professionals.

Note that these explanatory factors often do not exist alone. In most instances, more than one factor is involved in either helping or hindering the students' musical engagement and their musical behaviours. The students' musical behaviours and development depend very much on the condition of the child, nature of the context, and the degree of challenge or accessibility of the given musical tasks to match to individual child's needs over time. Therefore, the students' musical behaviours and development

are strongly influenced through the interplay and interweave of these factors.

Sections 11.3.1 and 11.3.2 provide a list of preliminary explanatory factors for the three students' musical behaviours and accompanied descriptions of these factors. Examples, which come from Appendix I, K and L, are provided to demonstrate the involvement of the explanatory factors in the three case studies within their own contexts. Section 11.3.3 provides a table to summarise the explanatory factors, with sample weeks from the three case studies.

11.3.1 A list of preliminary explanatory factors which may contribute to the students' more complex musical behaviours

The student-related factors (factors that relate to the children and young people)

- Intrinsic motivation (enthusiasm/enjoyment/initiation) (Sloboda, 1985; Hallahan *et al.*, 2005; Austin *et al.*, 2006; Hallam, 2006).

When the students showed their motivation in their learning (Erdonmez, 1993; Papoušek, 1996), it often accompanied musical preference (Trehub, 2006), familiarity with certain songs, initiation and willingness to participate, resulting in enjoyment and laughing (Pouthas, 1996) and enthusiastic interaction (Papoušek, 1996) with peers and the teacher. Sloboda (1985) noted that 'the ability to form and sustain goals seems to be an essential condition of learning' (p. 216). Very often when the students showed motivation and enjoyment in certain musical activities, they engaged better in the music lesson through their vocalisation, switch work, body movement and facial expression. Enjoyment and enthusiasm often contributed to the students' motivation in learning. The students often vocalised with great enjoyment and excitement, or they had big smiles on their faces when they indulged in certain musical experiences or one-to-one interaction with the teacher. Some of them would press a switch to sing a song, required an instrument that they wanted to play, or volunteered to participate in a musical activity which related much to their learning motivation.

Motivation (Papoušek, 1996) could be observed among the three students. For example, J found the banana activity funny and he laughed. At the same time, J seemed to recognise the distinctive groups of chanting patterns, the structure of the activity, and the causal relationships between other people's action and the switch sounds that he

pressed (J, week 21). With the drumming and simple tune background music, a TA held K's hand to tap the rhythm of the drum beat, which was also played by the computer, and later tapped the beat on K's hand to facilitate her sensory ability to feel the tempo. K vocalised most enthusiastically and she looked at the TA constantly with a big smile (K, week 18). While moving to the music, H vocalised along with the CD music and he used certain gestures to convey meaning, i.e. pointed. It was very impressive to see H dancing and vocalising on his own initiative (H, week 30).

- Musical preference (musical memory/familiarity/repetition/concentration/ musical awareness and response/anticipation/auditory discrimination) (Lecanuet, 1996; Pouthas, 1996; Hallahan *et al.*, 2005; Hargreaves *et al.*, 2006; Parncutt, 2006; Trehub, 2006).

Musical preference involved attitudinal and cognitive aspects in terms of musical memory (Hodges, 2006; Parncutt, 2006), familiarity (Lecanuet, 1996), repetition (Pauthas, 1996; Trehub, 2006), concentration, awareness and response of sounds (Abrams & Gerhardt, 1997; Mosby, 2002; Karmiloff & Karmiloff-Smith, 2003), anticipation and auditory discrimination (Trehub, 2006). Hallahan *et al.* (2005) explained that 'students with learning disabilities often lack appropriate metacognitive or executive control abilities and therefore cannot apply their skills and knowledge effectively' (p. 254). Repetition in practice and actions that relate to certain musical pieces, seemed to reinforce the students' musical memory, familiarity and preference (Lecanuet, 1996; Papoušek, 1996; Parncutt, 2006; Trehub, 2006). Sloboda (1985) wrote that 'people generally become skilled at some task by being presented with repeated opportunities to engage in elements of the task' (p. 216). Furthermore, Hargreaves (1986) presented the relationship between repetition and preference and stated that 'liking for novel, initially unfamiliar pieces should be low; that it should rise to a peak with increasing exposure and familiarity; and then decline with further exposure' (p. 118).

It appeared in the empirical data that the students showed their musical memory and preference from early on (Lecanuet, 1996; Karmiloff & Karmiloff-Smith, 2003; Parncutt, 2006; Trehub, 2006), in terms of the timbre of certain musical instruments, rhythmic chanting, or melodic lines of a song. When these students showed recognition of a tune, they were more likely to participate actively and in time and also sometimes in tune (Papoušek, 1996) through singing/vocalising or switching work. They would make a simultaneous response or take turns on alternation of rhythmic patterns

throughout the song. Musical memory also related to the students' concentration and awareness of their own names, names of group members, environmental sounds and cultural music (Mosby, 2002; Karmiloff & Karmiloff-Smith, 2003; Parncutt, 2006). They often showed a variety of awareness of sounds and music (Fassbender, 1996) that surround them day by day. When these students concentrated well and had active participation and patience (Lecanuet, 1996; Papoušek, 1996; Malloch, 1999; Trehub, 2006) to await their turn in the music lesson, they were likely to elicit more complex musical behaviours. Musical memory (Lecanuet, 1996; Pouthas, 1996; Hodges, 2006) in relation to the students' anticipation and listening skills (Trehub, 2006) had an important role to play for them to participate in musical activities and carry out their tasks with good timing (Malloch, 1999; Trevarthen, 2002; Parncutt, 2006; Trehub, 2006) through their switch work or vocalisation. It also had a strong correlation with these students' concentration and familiarity (Lecanuet, 1996; Parncutt, 2006) with various songs. In order to maintain the students' concentration, to increase musical knowledge, or to test familiarity of certain learned musical material, the music teacher often used 'question and answer' or a 'mistake detection game' to help the students to learn and improve their musical memory (Pouthas, 1996). The students were also provided with opportunities for decision making on music cognitive questions, evaluation of their own work, choosing a musical part (tapping or singing) to taking in a musical activity and distinguishing different musical motifs.

Musical memory (Lecanuet, 1996; Hodges, 2006; Parncutt, 2006) could be observed among the three students. For example, when the teacher sang the song 'sugar cake' to the class, J listened carefully and concentrated well throughout the whole song and vocalised the very last word 'lot' spontaneously and simultaneously both in good timing and pitch with the teacher's singing (J, week 17). For recognising and distinguishing various musical phrases, the teacher gave each child a different musical phrase, and then he sang and played a tune on the piano. When the teacher asked who thought it was their tune, they needed to hit their switches and sing it back to him. K pressed the switch in good timing just after the teacher had sung her musical phrase and then she pressed it again (K, week 15). In a 'mistake detection game', the teacher intended to make mistakes when singing a song that the students had learned, and asked the students to say 'stop' when they heard mistakes. H knew and immediately said 'no' when the teacher sang the wrong word (H, week 25).

- Imitation (instruction following/good timing) (Paynter, 1982; Green, 2001; Malloch, 1999; Ockelford, 2008).

In the students' music learning, they often imitated various musical tasks from the music teacher's modeling or instruction. They might have imitated parts of a specific rhythmic pattern through vocalisation, tapping or switching. Very often, they imitated singing, one to two words in each musical phrase, a music technical word, e.g. bow, actions/hand signing relating to musical notes or the lyric of a song, or the teacher's hand movement. While imitating and following instructions, the timing component has had an important role to play. The students were asked to follow the teacher's guidance to complete their musical tasks as required in an expected time frame. They might show some understanding of the structural features of a simple piece of music and participate in pressing the switch, vocalising in time to produce a specific effect, or taking turns in the right order with their peers.

Imitation (Fassbender, 1996; Papoušek, 1996; Pouthas, 1996) and good timing (Malloch, 1999; Trevarthen, 2002; Parncutt, 2006; Trehub, 2006) could be observed among the three students. For example, in a listening and copying activity, J took turns with the teacher and he vocalised a few words after the music teacher sang each phrase of the song 'sugar cake'. He could sing the last word of the song (lot) clearly and simultaneously with the teacher in good timing (J, week 18). In reviewing different rhythmic patterns, the teacher asked H to tap the rhythm 'ta ta ti ti ta' (♩ ♩ ♫ ♩), H imitated the teacher's tapping and tapped the rhythm on his knee. Even though H was much behind in his imitation, he seemed to tap the correct rhythmic pattern well for once (H, week 32). K pressed the switch in good timing by following the teacher's instruction on the first and second time, and the ensemble rhythmic chanting seemed to go well (K, week 11).

- Vocalisation and movement to music (self–expression/self–confidence) (Lecanuet, 1996; H. Papoušek, 1996; M Papoušek, 1996; Pouthas, 1996; Trehub, 2006; Welch, 2006).

The students often used their vocalisation as part of their daily communication and self-expression which seemed to develop early on (Pouthas, 1996). It also played a significant role in their engagement and participation in musical activities and for showing their musical preferences (Papoušek, 1996; Trehub, 2006), e.g. showing their

awareness of the ending of a song through vocalisation, screaming with excitement, or singing certain words with the teacher. Self-expression was often exhibited through verbalisation, vocalisation, facial and body movement and gesture.

Verbal and vocal communication could be seen more obviously with both H and J. H's verbal communication seemed to improve much over time and in a later observational period, he appeared to be more confident in using his voice. As for J, his vocalisation (Papoušek, 1996; Welch, 2006) got more confident when a familiar TA sang the music with him and he would turn to the TA in a louder voice at the end of the song. Movement to music (Pouthas, 1996; Karmiloff & Karmiloff-Smith, 2003; Trehub, 2006) also served as a way of self-expression and self-confidence for the students which involved dancing to the music, clapping, tapping, or stamping to the beat, and any actions that accompanied or relate to musical pieces (Trehub, 2006), e.g. conducting for four beats or moving hands up and down according to different musical notes.

Vocalisation (Papoušek, 1996; Welch, 2006) and movement to music (Lecanuet, 1996; Parncutt, 2006) could be observed among the three students. For example, on the song 'hop along popcorn', J vocalised after each phrase that the teacher sang. It seemed that he could roughly sing the words 'pan', 'in', 'down' in turn taking with the teacher clearly and sang 'can' simultaneously with the teacher (J, week 18). H focused on imitating the staff's actions as a kind of hand signing to the lyric of a song quite well (Fassbender, 1996). He also did it almost in time with only a few seconds delay, in signing most parts of the song (H, week 37). When the teacher played the song on the CD again and asked the students to listen to it, K vocalised towards the end of the song in an excited voice (K, week 34).

- Musical interaction (social interaction/leadership/independence) (Malloch, 1999; Papoušek, 1996; Pouthas, 1996; Marsh and Young, 2006).

Papoušek (1996) and Pouthas (1996) both noted that the music interactional games provide rich source of rhythmic stimulation for infants and develop infants' ability to perceive order and duration, to synchronise their own rhythms with those of their environment (Pouthas, p. 128), and to facilitate the 'infant's attention and pleasurable arousal on a potentially optimal level' (Papoušek, p. 102). Findings in this research showed that musical interaction (Malloch, 1999) between the students, their peer groups and the school staff seemed to help with the students' performance on their musical

tasks and their motivation, whether it was a sequential turn taking game or a free improvisation. During peer interaction, the students were happy to be appointed as leaders in musical activities and they took the leader role in the music class. Sometimes, they were able to complete their musical tasks by themselves without any help or any additional prompting by the staff in a one-to-one or peer interaction (Malloch, 1999; Papoušek, 1996). For example, during music improvisation on the Soundbeam, the students interacted independently with their peers in giving an appropriate response within the structure of a familiar song followed by the teacher's instruction.

Peer interaction could be seen more obviously for J and H. J improvised music with another child using the Soundbeam, working within the structure material which was offered in simple ways by the music teacher (J, week 14). H was chosen to be a conductor because he was the best musician in their last performance. H pointed to different signs and waited patiently for others to play their sounds before he pointed to the next one. He also tried to look around to see if the person was playing when he pointed to a sign (H, week 20). From time to time, K also showed active participation in peer interaction. K switched the musical phrase while all the staff and other students did the action according to the singing (K, week 36).

The music teaching factors (teaching strategies and music curriculum)

- Teacher's personality (humour/patience/encouragement) (Hallam, 1998; Davidson & Burland, 2006; Hodges, 2006; McPherson & Williamon, 2006).

The music teacher's personality involved humour, patience (Lecanuet, 1996; Papoušek, 1996; Malloch, 1999; Trehub, 2006), and encouragement which he brought to the music lesson. The teacher's positive encouragement played a significant role in the students' learning. With many firm encouragements given from the teacher and TAs, the students seemed to be motivated and to respond more consistently to the teaching instructions, and with their interaction in either singing or pressing the switch (Malloch, 1999; Papoušek, 1996). Furthermore, where there was humour, there was laughter. The students often paid close attention to laughs in the music lesson and the music teacher used humour to elicit happiness and a relaxing atmosphere in the classroom. For example, when the teacher sang in a high pitched female voice, K laughed and found it funny hearing a male sing in a female voice (K, week 2).

In addition, when giving sufficient waiting time to the students for their response, they would have a better chance to respond and participate in a musical activity, e.g. vocalising the last word of a rhythmic chanting through imitating the teacher's sounds (Fassbender, 1996), or in Q and A time for music cognitive questions. When given enough time, J and K were able to respond in an activity more successfully. On another occasion, it seemed that J may have recognised mistakes and pressed his switch to say 'stop' along with the teacher's verbal cue and intended waiting time (J, week 15). The waiting time varied for different students and for different days in 'one-to-one' or 'group interaction'. Prolonged waiting time was given to the students for their choice making, especially for K. The teacher particularly waited a longer time for K to switch with the right answer. K pressed the switch which recorded 'that's the one' after the teacher had waited 12 seconds for her response (K, week 4).

- Pedagogical style (Interactive Music/Intensive Interaction/dramatic expression/musical interaction/multiple sensory approaches/partial prompt/demonstration/role-play/conversation participation) (Corke, 2002; Nind & Hewett, 2005; Hallahan *et al.*, 2005).

Kellett and Nind (2003) noted that Intensive Interaction is an approach 'to facilitating the development of social and communication abilities in people with severe learning difficulties (SLD) based on the model of caregiver infant interaction' (p.7 in Nind and Hewett 2001: vi). The teacher often used an exaggerated facial expression, hand gestures, and also vocalisation (Lecanuet, 1996; Parncutt, 2006) to grab the students' attention and maintain their focus, interest and concentration during the musical activities. The music teacher's pedagogical style involved Interactive Music, Intensive Interaction, dramatic expression, one-to-one interaction (Malloch, 1999; Papoušek, 1996), multiple sensory approaches, partial prompt, demonstration and role-play. All the three students enjoyed direct one-to-one and face-to-face interaction with the teacher in taking turns or in music ensemble (Pouthas, 1996). It appeared that the pedagogical style involved Intensive Interaction could have elicited more positive response from the students.

The students also appeared to be sensitive to sounds and touch in the music lesson. When the teacher involved other sensory inputs into musical activities, the students appeared to respond in their tasks more effectively and accurately. Furthermore, this also helped with their musical memory (Pouthas, 1996). For example, tapping a steady

beat on a student's hand, feeling the surface of a musical instrument, moving a student's hand up and down, corresponding to high and low notes, to establish the relationship between the space and pitch, and shaking hands in an interactive song. In the music lesson, the students often found it easier to complete their musical task with the teacher's verbal assistance and visual signal in finger pointing, e.g. pressing different coloured switches according to a specific rhythmic sequence, in good timing (Malloch, 1999; Trevarthen, 2002; Parncutt, 2006; Trehub, 2006), or using different coloured switches for the students to do it in the right order to complete a song. The teacher also needed to remind the students about the waiting time in advance of their turn.

Apart from multiple sensory approaches, the music teacher provided various musical activities in the music lesson for differentiation and maintenance of motivation (Papoušek, 1996). A good variety of different musical activities in individual, pair work, and ensemble work provided the students opportunities to use different methods, e.g. switch, movement, vocalisation, verbalisation, to participate in their music class. This appeared to be a good teaching strategy in order to keep the students from getting bored, becoming tired, and helping them to find ways in participating. In addition, the music teacher often developed a variety of different ways to practise the same musical material and it showed that the students became better at a musical task as they practised more, before they got bored. For example, J was asked to press the switch to sing a four-phrase song by himself and, later on, the teacher and J took turns on the alternation of rhythmic patterns and singing on the switch for different musical phrases of the same piece (J, week 17).

In general teaching practices to activate learning and memory, as Hallahan *et al.* (2005) addressed, which include 'providing advance organisers, activating background knowledge, providing distributed practice, engaging students in dialogue, and setting appropriate expectations' (p. 255). During various musical activities, the students relied much on the teacher's verbal explanation and modelling to carry out their musical tasks. For example, the teacher used instrumental playing with contrasting timbre to demonstrate the pause of three, the switch to link musical phrases together, or sing a song while doing the actions. To encourage participation and motivation (Papoušek, 1996), the teacher used role-play from time to time to introduce a new learning material, or to provide opportunities for different responses from the students. The teacher would use a pre-recorded social script on the students' switch or directly act out a scene from

the material he wanted to teach.

The 'Intensive Interaction' was observed among the teaching with the three students. For example, for J, the teacher used exaggerated and dramatic expression (Lecanuet, 1996; Parncutt, 2006) with the teaching material, e.g. sing in high-pitched female voice, read a poem/lyrics in 'spooky' sounds or produce dramatic animal sounds (J, week 22); and by using a variety of different qualities of the voice, e.g. loud voice, squeaky mouse voice, whisper voice and monster voice (J, week 15). These changes seemed to maintain J's focus and concentration. For K, the teacher used his hand gesture when talking to K. K had her head down but later on she lifted up her face and had a smile (K, week 22). For H, in an imaginary play, the teacher asked H how many goats he had brought with him, which related to the song they were singing, and offered choices (Marvin, 1998) of one or three and H pointed to one. Then the teacher asked H to make a goat's sound, H said 'maaa' and every student in the class laughed (H, week 26).

- Music making (individual and group improvisation/musical ensemble) (Wood, 1983; Schalkwijk, 1994; Wigram, 2004).

Music making sometimes was the highlight of the music lessons. Music improvisation as one of many ways to make music was utilised through Soundbeam, switch work, keyboard, or computer software. The students could use their creativity, within their capabilities, independently to make music through these resources. Another form of music making was through musical ensemble. The three students seemed to enjoy any form of musical ensemble, whether it was switch or Soundbeam work with their peers or the teacher.

When working with another student who pressed the switch to produce the piano playing on the melody, J pressed the switch well on the last bar of the musical phrase when taking his turn in ensemble with others (J, week 10). For H, the teacher recorded the melody (1 1 1 | 1) on a switch for 'bam-ban-dy ya'. H volunteered and raised his left hand. The teacher played the whole song on the piano while taking turns with H on the musical phrase (1 1 1 | 1). He pressed the switch on melody (1 1 1 | 1) synchronising with the teacher's piano playing (H, week 26). On keyboard

improvisation, K smiled and using her right hand she pressed the keyboard by herself. Then she used her left hand to press the keyboard as well. She was very excited about the sounds she had made and gave a big smile. The researcher thought that K did the improvisation very well on the theme 'night time music'. She did it independently and engaged in the music making all the way through. The music itself had a clear beginning and ending, with loud and soft sounds, different duration of notes, and good changes in the musical elements as well (K, week 22).

- Extrinsic motivation (positive rewards and music competition) (Hallam, 1998).

Positive rewards, e.g. praise, non-verbal reinforcement (smile and pay attention), tokens (a sticker or symbols), drink and sweets, desired activities (computer games) in collaboration with other professionals, were often given to the students by the music teacher when they had performed well in music, or the music teacher wanted to 'encourage repetition of desirable behaviours' (Hallam, 1998, p. 93). For example, the teacher corrected H and wanted him to link the musical phrases together without leaving any space between them. H did better switching with accurate timing on this occasion and the teacher gave him instant praise (H, week 14). For positive rewards, the teacher used symbolised 'happy face' with ticks to record the students' progress during that lesson in the primary department. In the secondary department, the teacher used different coloured star stickers to stick in the students' progress report book in the same way.

Music competition between peer groups seemed to help with the students' motivation in learning, and the students often showed good concentration throughout the activity. Normally it happened in two groups taking turns to carry out their musical tasks through switching or vocalisation and the teacher gave scores or comments about their performance at the end of the activity. For example, J concentrated and pressed the switch well when it was his group's turn to chant a certain rhythmic pattern with another group (J, week 11).

The school environment factors (TAs, teaching resources and collaboration ethos)

The nature of the context seemed to play a significant role in the students' musical development as Papoušek (1996) indicated that 'the amount of music productivity, and its accuracy and richness, depend to a large degree on the musical environment' (p. 107). The staffing, resources and collaboration ethos in the school environment played an

important part in facilitating the musical behaviours and development for children and young people who had complex needs.

- Additional staff (familiar TAs/high TA ratio/TAs' partial help/TAs' input) (Hutchinson, 1998).

The students' daily teaching assistants knew these students well and some of them 'can easily identify even the most subtle changes' (Hutchinson, 1998, p. 12) for the students. TAs were very important for the students' learning, especially for J and K. J and K seemed to develop a certain level of attachment towards their one-to-one TAs in the school. They were calmer, participated better, and were being guided better with their preferred or familiar TAs. Because the one-to-one TA knew the students better (they worked with the students five days a week), they knew how much help was sufficient to give to the students, e.g. adjusted the students' switch to make easy access for them, whispered in their ears when it was their turn, made a sign and gave a verbal cue, or put their hand underneath the students' elbow to support their switching.

At times, TAs' encouragement and input, e.g. 'use your switch if you think it is a short sound', were very important aids towards the music teacher's teaching. In some occasions the students seemed to respond better towards their one-to-one TAs' encouragement than the teacher's general instruction. Furthermore, when collaboration with other professionals took place in the music lesson, a high ratio of TAs was often involved. For example, when special music projects (i.e. 'Music Makers Sing' and end-term secondary department musical show) were launched in the music lesson, each student was assigned a teaching assistant to help them with their individual musical tasks in practice and on the performance day.

One-to-one TA's input to facilitate the students' learning could be observed among the three students. For J, when the teacher's verbal reminder failed, a TA moved the switch closer to J and J then pressed the switch after the teacher's verbal encouragement (J, week 21). For H, when it was another student's turn to be a conductor, H played by himself after his TA had given him a hint indicating that it was his turn. He seemed to have good concentration on the task with the TA's assistant (H, week 20). For K, a familiar TA who was working with K had many facial expressions, eye contact and she gave simple and short verbal instructions while talking to K. This seemed to help K's understanding of the class context profoundly (K, week 18).

- Teaching resources (Byers, 1998; Hallam, 1998; Adams, 2001; Spruce, 2002).

When the music teacher strived to plan the differentiation for individual needs by making musical achievement accessible for the children and young people with complex needs, music resources in the special school were also facing the same or even more frustrations of space and varieties than in mainstream school. Philpott (2001) addressed that 'music is and always has been in a position of fighting for time and resources' (p. 121). A variety of different teaching resources, such as the keyboard and music technology (Odam, 2002), Soundbeam, and switches were observed to enable the students to be more independent in their engagement with musical activities. In addition, the vocal flexibility and creativity of the teacher and a wide selection of recordings from the teacher were also served as part of teaching resources (Bannan, 2002) along with other percussion instruments, piano, CD player and computer equipment. Soundbeam and switch work functioned as encouragement for motor-coordination and speeded up reactions.

Some of the teaching resources seemed to provide more freedom for the students despite their physical disabilities. For example, the Soundbeam enabled J to have an increased physical capacity to produce an improvised piece of music through moving his hands in front of the Soundbeam. In the Soundbeam work, J also seemed to enjoy the musical experiences of solo, pair work and ensemble using the Soundbeams with others where he could maintain an independent part (J, week 14). For H, he pressed the switch to sing 'bam-ban-dy ya' in liaison with the teacher who sang the song 'Mr. Ram-Goat-O'. He pressed the switch in correct timing in taking turns with the teacher (H, week 26). For K, a variety of methods for using the switches to enable her to be more independent was carried out in the music lessons. K composed and performed three simple and short musical phrases by using three switches with notes on C, E and G without any help (K, week 5).

- Collaborative ethos (collaboration with multidisciplinary team and other professionals/collaborative music projects) (Lacey, 1998; Marvin, 1998; Ouvry, 1998; Plummeridge, 2001; Hallahan *et al.*, 2005; Jellison, 2006).

Plummeridge (1991) claimed that participating in public music events 'involves individuals being conscious of their responsibility within a team and recognising and respecting the contribution of others' (p. 117). Music performance projects and

collaboration between professionals, were observed to help a great deal with the development of the three students' musical behaviours as part of their musical enculturation (Burnard, 2006). A crucial thing for a successful musical performance project was the involvement of additional school staff and full support from the school management team. On the special music project, 'Music Makers Sing', a music technician used switch pads to enable J to participate in the musical performance, and recorded his singing on the computer and later played it back to him (see J, weeks 16, 18, 19). A few musicians also visited the special school from time to time and took part in the lessons, or held a little concert. The musicians were either involved in a special music project or they just simply joined in the lesson. They made a contribution to the music curriculum when there was a need, e.g. played an uplifting accompaniment in a song to keep a regular beat, or performed live music at the end of the lesson.

Collaboration with other professionals was observed in the three students. In J's music lesson, a cellist and a viola player played an introduction and accompaniment for the song 'sugar cake'. The music teacher gave each student a musical phrase and pressed their switch in the right order to sing the song in their rehearsal (J, week 19). In K and H's music lesson, a violinist and a double bass player visited the music class. They played background music to support the students' musical activities. The two musicians accompanied the students' singing by providing a regular beat and an uplifting rhythm for them. They played the accompaniment part throughout the students' practices (K and H, week 2).

11.3.2 A list of preliminary explanatory factors which may contribute to the students' simpler musical behaviours

The student-related factors

- Nature of disabilities/difficulties (health condition/comprehension limitation/ physical disability/sensory impairment) (Goldsmith, 1998; Hutchinson, 1998; Lacey, 1998; Hallahan *et al.*, 2005).

The students' health condition had a significant influence on their music learning. Due to their health issue or other possibilities, they might appear with head down, slow to react, sleepy or did not look well. One possibility was the mental illness for the students as Hutchinson (1998) claimed that 'there is a higher incidence of mental illness in

people with learning disabilities than in the general population' (p. 11). Another possibility might be due to the sleeping problems that the students were having at home, as Goldsmith (1998) identified that 'people with multiple neurological disabilities associated with distortion of body shape often have disturbed sleep which does not respond easily to treatment' (p. 23). All these health issues often affected a great deal on the students' attention, concentration and their musical performance on the day.

The students might also have comprehension limitation and cognitive difficulties to understand what was going on in the music lesson, e.g. symbolisation on different animal sounds to different percussion instruments. Lacey (1998) noted that 'if IQ was measurable, the World Health Organisation suggest that people with PMLD would lie in the below 20 range, indicating that they were in a very early stage of development (p. ix-x in WHO 1992). In addition, the nature of the students' physical disabilities and sensory impairment could sometimes make it difficult for them to carry out certain musical tasks, e.g. to tap a rhythmic pattern, to have a regular beat, to press different colored switches in turn, to play an instrument or to join in group discussion. The group discussion activity among peers did not seem to be effective during the observation and if the teacher did not take a guiding role in the small group, there was almost no interaction between the students and their peers, except for H. These difficulties often combined together in real scenarios. For example, when the teacher asked the students to play sounds on an instrument according to a certain symbol, the students faced two difficulties in that they needed to have enough understanding to make the connection between symbol, sounds and objects (……, short sounds, wood drum), and they needed to have sufficient physical ability to play the instrument by themselves and, or else, they needed the school staff's full support.

Nature of difficulties could be observed among the three students. For example, due to J's physical disabilities, he was fully prompted by a TA to play the drum when it was his turn (J, week 11). H pressed the switch four times in rather good timing (Malloch, 1999; Trevarthen, 2002; Parncutt, 2006; Trehub, 2006) on a song to link the four phrases together, twice. However, when the teacher asked H how many times a student needed to press the switch in the song, H indicated 'one'. H did not seem to understand the question which related to his own movement or the concept of number (H, week 6). K did not look alert or well. Her head was drooping when she came into the lesson in week 16. There was no obvious intentional communication from K to answer the

teacher's question or to interact with staff or peers (K, week 16).

- Habit (Sloboda, 1985; Lecanuet, 1996; Parncutt, 2006; Trehub, 2006).

The three students had different habits in their learning which corresponded to the ambiguity of their musical behaviours. For example, it took a longer time for K to press her switch for the first time, but once she got it going she appeared to be enthusiastic. She tended to keep pressing her switch no matter if the song had finished or whether she needed to wait for another child's turn. For H, he tended to repeat the last word of a choice that the teacher offered to him, or he just answered 'yes' to most of the questions that the teacher asked him. Sloboda (1985) wrote that 'the principal feature of a habit is that it is automatic, and that it uses up little or no mental capacity to execute' (p. 216). On other occasions, H had the habit of saying 'yeah' in response to the teacher's instructions several times, but it was difficult to know how much H had really understood the teacher's instruction.

When the students responded to the teacher's questions or carried out certain musical tasks, sometimes their responses were difficult to hear. It might be due to their medical condition, verbal ability, self-confidence, or the way they controlled their voices. Habits could be observed especially for H and K. For H, when the teacher asked him how many lines there were in the song and gave him two choices – two lines or five lines, H imitated the last words spoken by the teacher (Fassbender, 1996) and said 'five lines'. This might be due to H's custom of repeating the last words uttered by the teacher but not knowing what they meant (H, week 3). When K pressed the switch, she did it twice to sing the first and third phrases without giving the other student a chance to tap on his tray (K, week 14).

- Fluctuation (lost concentration/timing problems).

Based on the researcher's observation, fluctuating performance level often correlated with lost concentration and other unknown reasons for the causes. The students' fluctuating performance level often accompanied certain behaviours such as head down, delayed timing, wrong timing, tenseness, or inactivity. For instance, K sometimes became tense in her muscles during the music lesson, which often hindered her participation in the musical activities (K, week 16). In musical activities or in the teacher's demonstration, the students could lose their concentration and that happened in various contexts. For example, J lost his concentration and forgot his own part after

listening to the teacher's instrumental playing as a demonstration. At times, K found it difficult to focus and to make choices (Marvin, 1998) when the options were presented to her.

The students might also lose their concentration when distracted by people, sounds and objects. Often the students were distracted by people coming into the hall, people talking to their TAs, peer laughing, or being obsessed with certain objects. Also, when the students waited for some time for their turn in the group, they easily lost their concentration. They lost interest, felt bored, or did not understand the musical tasks which they were asked to do. Fluctuation in the students' performance also related to their timing problems. The students, especially J and K, experienced delayed timing in their musical response. The delayed timing response often became the wrong timing in that when the students responded, it was often in a completely different context because the music teacher had already moved on to another activity.

Fluctuation could be observed among the three students. J was very easily distracted by people who came into the hall in the middle of a lesson and thus lost his concentration. For example, J smiled instead of pressing the switch when a music technician came in the room while everyone was waiting for him (J, week 21). K waited for 29 seconds before she activated the singing that the teacher had recorded on the switch for the first phrase and about 49 seconds for the second phrase of the song 'bells in the steeple' (K, week 4). In a group practice, the teacher asked H to press the switch to read the text while the other students sung the song. In the first instance, H did not press the switch hard enough to make it sound. At the second attempt, H pressed the switch before the teacher and other students had finished their singing. At the third time, H pressed the switch, but with a delayed response, and he missed out on one of his turns. H needed the teacher's constant physical cue to tell him when he needed to press the switch, otherwise he missed his turn and found it hard to keep it in time with the CD's accompaniment music (H, week 16).

The music teaching factors (teaching techniques; music curriculum)

- Degree of challenge and match to individual needs (music curriculum design/conceptual difficulties/new learning material) (Goldsmith, 1998; Marvin, 1998).

In special education, Marvin (1998) specified that the children were often expected to follow the lead and their communicative intent is often overlooked (p. 122). During the observation, the music teacher was usually the main leader and he would at times pick out the students' communicative intent when he saw it was appropriate. Certain music curriculum design and the proportion of time spent on them, e.g. musical arrangement on ICT and DVD watching sessions, did not seem to be conducive to musical advancement, in which one-to-one interaction or peer interactions were few. For example, H and K watched a music DVD for a whole music lesson. K often lowered her head and seemed to move her head arbitrarily when she found the teacher's 'Q and A' were difficult to follow (K, week 17).

The degree of challenge that matched the students' needs played an important part in their musical behaviours and development. Certain difficult musical tasks challenged the students' disabilities, comprehension and sense of timing, e.g. specific rhythmic chanting/tapping or structured instrumental playing which often required the teacher and TAs' full prompt. Accurate timing was especially crucial in structured instrumental playing. Due to the nature of the students' difficulties and their sense of timing, this kind of musical activity was fully prompted by the staff which meant that the students lost their independence for carrying out further musical tasks.

It seemed to take more time for the students to learn new materials, e.g. a new song. (J, week 22) and a new poem (K, week 21). Certain musical tasks appeared to challenge the students' understanding, including rearranging a simple music piece through a music programme called 'Garageband' using ICT (K, week 7) or mental representation of distinctive musical phrases incorporating symbolisation and time space, e.g. thinking voice and singing voice. The thinking voice meant that the teacher sang the musical phrases in his head and used a finger to tap the rhythmic patterns, or the beat, quietly on his head. All three students found it hard to link the silence (while the teacher tapped his head for the beat or the rhythm of a phrase as the thinking voice) to the musical task that they needed to do, e.g. to sing or play instruments for the next musical phrase.

The challenging tasks could be observed among the three students. For example, in J's musical lesson, musical activities involved structured instrumental playing, ensemble work and symbolisation, e.g. phrase A played with or associated with a drum and phrase B associated with a shaker. The teacher played randomly for phrases A and B and asked

the students to play their instruments accordingly. J was fully prompted by his TA to complete the challenging task (J, week 6). One TA held K's hand to move up and down to do the song drawing according to the up and down of the melody with a CD's accompaniment recording (K, week 16). In a group practice, H was doing the rhythmic clapping (♫♫ | ♫♫ | ♪.♪ ♪♪ | ♩ ♩) while a TA and the other student did the singing part (3 3 3 5 | 3 3 3 2 | 1 12 1 5 | 6 6). In the rehearsal, the TA slowed down the clapping for H. He found it easier to tap on quavers and crochets, with a bit of delay, but found it difficult to clap the dotted quaver and semiquavers (H, week 6).

The school environment factors (TAs, resources, music projects)

- Additional staff (low TA ratio/too much help/fully prompt) (Hutchinson, 1998).

From time to time, the music lessons in K and H's class had a low TA ratio because the TAs needed to have morning meetings with the school management team and were unable to attend the first half of the music lesson. Particularly for J and K, it appeared that some of the TAs, who were often comparatively new to the students from their one-to-one TAs, did not wait long enough for the students to respond. Instead, they held the students' hand and took over to do the required musical tasks. For example, the music teacher played on the piano to create a sound screen accompaniment and read the poem while J and the other students did the same task again. J was helped by the TA to play the cowbell so that he could participate (J, week 15). K had her head down and when it was her turn, a TA held her hand to press the switch without waiting for her to do it by herself (K, week 28).

11.3.3 Overall summary of the preliminary explanatory factors

Table 11.2 summarises the proposed preliminary explanatory factors that may contribute to the three students' simple and complex musical behaviours. It also provides the example weeks from the case studies, which offers an easy access for further reference. For detail of the example weeks, see Appendix I, K and L. These preliminary explanatory factors are not listed in any order of importance.

Table 11.2 Summary of the preliminary factors that may contribute to the three students' musical behaviours

Complex musical behaviours	
The student-related factors	**Example weeks**
Intrinsic motivation (enthusiasm/enjoyment/initiation)	(see J, weeks 14, 15, 17, 18, 19, 21; K, weeks 5, 9, 10, 18, 22, 29, 38; H, weeks 2, 3, 6, 14, 15, 19, 21, 25, 26, 28, 30, 33, 34, 35)
Musical preference (memory/familiarity/repetition/concentration/musical awareness and response/anticipation/auditory discrimination)	(see J, weeks 3, 6, 7, 10, 12, 14, 15, 17, 18, 19, 21; K, weeks 3, 7, 15, 22, 27, 28, 29, 30; H, weeks 3, 12, 15, 16, 18, 19, 20, 21, 22, 25, 27, 30, 32, 33, 35, 38)
Imitation (instruction following/good timing)	(see J, weeks 10, 12, 15, 17, 18, 19, 21; K, weeks 2, 5, 9, 10, 11, 14, 15, 27, 29, 37; H, weeks 2, 3, 4, 6, 11, 12, 14, 15, 16, 18, 19, 21, 22, 24, 25, 26, 27, 28, 30, 32, 33, 34, 35, 37, 38)
Vocalisation and movement with music (self–expression/self–confidence)	(see J, weeks 6, 14, 17, 18, 21; K, weeks 2, 11, 14, 34; H, weeks 11, 18, 20, 22, 27, 30, 33, 35, 37, 38)
Musical interaction (social interaction/leadership/independence)	(see J, weeks 3, 5, 6, 10, 14, 19, 21; K, weeks 3, 6, 11, 15, 20, 22, 29, 34, 35, 36, 38; H, weeks 4, 6, 11, 14, 15, 16, 19, 20, 22, 24, 25, 26, 28, 33, 35, 37, 38)
The music teaching factors	**Example weeks**
Teacher's personality (humour/patience/encouragement)	(see J, weeks 3, 5, 15, 19, 21; K, weeks 2, 4, 11, 25; H, weeks 11, 12, 14, 19, 25, 26, 33)
Pedagogical style (Interactive Music/Intensive Interaction/dramatic expression/musical interaction/multiple sensory approaches/partial prompt/demonstration/role-play/conversation participation)	(see J, weeks 5, 6, 10, 15, 16, 17, 18, 19, 20, 21, 22; K, weeks 2, 3, 4, 5, 9, 15, 16, 18, 19, 20, 21, 22, 27, 28, 29, 34, 35, 36; H, weeks 2, 4, 6, 14, 15, 16, 18, 19, 20, 24, 25, 26, 28, 32, 33, 35)
Music making (individual and group improvisation/musical ensemble)	(see J, weeks 10, 14, 19, 21; K, weeks 5, 15, 22; H, weeks 11, 15, 16, 21, 22, 25, 26, 32, 33)
Extrinsic motivation (positive rewards and music competition)	(see J, weeks 5, 11; H, week 33)
The school environment factors	**Example weeks**
Additional staff (familiar TAs/high TA ratio/TAs' partial help/TAs' input)	(see J, weeks 14, 19, 21; K, weeks 9, 16, 18, 19, 20, 21, 28, 29, 34, 35, 36, 37, 38; H, weeks 14, 15, 20, 22, 37, 38)
Teaching resources	(see J, weeks 10, 14, 15, 17, 18, 19, 21; K, weeks 2, 3, 5, 9; H, weeks 26, 34)
Collaborative ethos (collaboration with multidisciplinary team and other professionals/collaborative music projects)	(see J, weeks 16, 17, 18, 19 to 22; H and K, weeks 2, 34 to 38)
Simple musical behaviours	
The student-related factors	**Example weeks**
Nature of disabilities/difficulties (health condition/comprehension limitation/physical disability/sensory impairment)	(see J, weeks 3, 7, 11, 15, 18, 19, 21; K, weeks 4, 5, 6, 7, 16, 19, 20, 21, 27; H, weeks 6, 24, 25, 26, 27)
Habit	(see J, week 19; K, weeks 7, 14, 28; H, weeks 2, 3, 4, 7, 11, 12, 15, 20, 24, 25, 27)

Fluctuation (lost concentration/timing problems)	(see J, weeks 3, 7, 11, 19, 21; K, weeks 2, 3, 4, 5, 6, 7, 9, 11, 14, 16, 28, 35; H, weeks 2, 4, 6, 16, 18, 24, 25, 26, 32, 34, 35, 37, 38)
The music teaching factors	**Example weeks**
Degree of challenge and match to individual needs (music curriculum design/conceptual difficulties/new learning material)	(see J, weeks 6, 7, 11, 15, 22; K, weeks 3, 4, 7, 10, 14, 16, 17, 19, 21; H, weeks 6, 7, 16, 19, 20, 22, 25)
The school environment factors	**Example weeks**
Additional staff (low TA ratio/too much help/fully prompt)	(see J, week 15; K, weeks 7, 16, 28)

11.4 Critiques and suggestions for further research

In this section, the researcher provides several critiques concerning the theoretical and operational issues of the *SoI* framework. Suggestions for further research are also made following each discussed issue. The limitations of using the case study approach in this research are also addressed as a reflection of the whole research journey.

11.4.1 Theoretical issues

The theoretical gaps between the levels of the *SoI* framework

Ockelford (2008) noted that in the design of the *SoI* framework each individual domain and level has its corresponding chronological age to 'typical' musical development. Tables 11.3, 11.4 and 11.5 list the corresponding music psychological and developmental age of the *SoI* framework in the three domains. These tables show that there are some gaps or sudden jump between levels 4 and 5 and levels 5 and 6 of the developmental age mapping in the *SoI* framework. The design of the three domains follows step by step in detailed chronological age order from foetal development until the age of 11 months. However, after 11 months of age at level 4, there is a big gap between levels 4 and 5, where it has a huge jump to the age of 4 or 5 years in level 5. In addition, the developmental mapping has another big jump to the early teenage years in level 6 across the reactive, proactive and interactive domains.

Table 11.3 The reactive domain corresponding to 'typical' development

Domain	Level	Corresponding to 'typical' development (Ockelford, 2008)
Reactive	1	Four to five months prior to birth and earlier (p. 78).
	2	Four to three months before birth and first few months after birth (p. 78).
	3	Two-and-a-half to five months after birth (p. 79).
	4	7 to 11 months onwards (p. 79; p. 94).
	5	From the age of 4 or 5 years (p. 94).
	6	From the early teenage years (p. 94).

Table 11.4 The proactive domain corresponding to 'typical' development

Domain	Level	Corresponding to 'typical' development (Ockelford, 2008)
Proactive	1	Foetal development when movement becomes possible (p. 80).
	2	Birth and from four to six months after birth (p. 80).
	3	From four to six months after birth (p. 80).
	4	Between 7 and 11 months (p. 80; p. 95).
	5	From the age of 4 or 5 years (p. 95).
	6	From the early teenage years (p. 95).

Table 11.5 The interactive domain corresponding to 'typical' development

Domain	Level	Corresponding to 'typical' development (Ockelford, 2008)
Interactive	1	From birth (p. 80).
	2	From birth and two months onwards (p. 80).
	3	From two months onwards (p. 80).
	4	From the age of 7 to 11 months (p. 95).
	5	From the age of 4 or 5 years (p. 95).
	6	From the early teenage years (p. 95).

Because of the chronological and developmental age gap between level 4 (7-11 months onward) and 5 (from 4 or 5 years old), the *SoI* framework does not seem to have detailed equivalent SLD category in level matching. Since the working definition for SLD[1] from the PROMISE Report is 'from 12 to 30 months of usual development' (see Chapter 1, Section 1.2), there is a need to have more sufficient and detailed equivalent SLD levels to be matched in the *SoI* framework comparable to the levels 1 to 4 in the framework.

As an example, the following table summarises and compares the literature in Chapter 3 with the *SoI* framework (see Chapter 4) according to the reactive, proactive and interactive domains. The comparison involves 'typical' children's musical development from the end of the first year, until the end of the third year, which covers the gap between *SoI* levels 4 and 5.

[1] The working definition of SLD and PMLD in the PROMISE report:
Pupils with PMLD have profound global developmental delay, such that cognitive, sensory, physical, emotional, and social development are in the very early stages (as in the first years of usual development) and pupils with SLD as in the first twelve to thirty months of usual development (p. 9).

Table 11.6 An example of a gap between *SoI* levels 4 and 5 in corresponding to the 'typical' musical development

Age	'Typical' musical development
12th month (End of the first year)	Precocious music listening skills, excellent memory for music, highly musical environment, and intense interest in expressive musical performances (Trehub, 2006); Use crying, babbling, facial expressions, and bodily gestures to communicate their emotions to others in the first year (Parncutt, 2006); Discriminate vowel sounds by the end of the first year (Fassbender, 1996); Can reproduce and remember the order of musical sequences and causal relationships with each other through imitated canonical order during 12 to 24 months (Pouthas, 1996). Culture-specific metrical biases; Sensitive to musical phrases (Bee, 1997); Enjoy engaging in vocal play and babbling (Welch, 2005); Experimentation with sound 12-18 months (McDonald and Simons, 1989); The one-word stage during 12 to 18 months (Papoušek, 1996).
13th-18th month	Spontaneous vocalisation (Welch, 2005); remember the order of musical sequences; Regulation of operant response start to develop between 18 to 24 months (Pouthas, 1996). Able to use words in songs that they are unable to use in conversation; vocalisation in time to the music (Pound, L. and Harrison, C., 2003).
19th-24th month (End of the second year)	Repetition of brief phrases and various pitch centres of melodic contours (Welch, 2005); Melodic and rhythmic patterns appearing in vocalisations (McDonald and Simons, 1989); 19-24 months, free experimentation with songs; Short spontaneous songs, often consisting of a small melodic interval with a flexible rhythm pattern (McDonald and Simons, 1989)
25th -30th month	Arm and leg movements used; Synchronise their movement to a beat in a short period of time (Parncutt, 2006); Temporary synchronisation with the beat from about 10 percent of this age group: a chance occurrence (Moog, 1976). Spontaneous vocalisations of nursery songs from 2 to 5 years old (Pouthas, 1996); Use of melodic patterns from learned songs in spontaneous singing and is able to sing parts of songs (McDonald and Simons, 1989, p. 46). Join groups where they learn many basic cultural skills, including singing, dancing, and playing of instruments (Pound, L. and Harrison, C., 2003). Can reproduce sequences in an inverse order (Pouthas, 1996)

31st - 36th month (End of the third year)	Imitation of songs, though rarely with total accuracy (McDonald and Simons, 1989, p. 46). Enjoy clapping as an expression of rhythm and inaccuracies are due to the limitations of their motor control rather than lack of understanding; Spontaneous vocalisations usually include descending melodies ending on the lowest note; The beginnings and ends of tunes are often reproduced before the middle of the song can be reliably recalled. (Pound, L. and Harrison, C., 2003). Start to correctly reproduce random musical sequences through imitation at the end of the 3rd year (Pouthas, 1996); Variety of movements declined; A period of practicing and exploring known movements (Moog, 1976); Start to impose a structure on their improvisations by repeating selected patterns (repetition and contrast); To get together quite diverse rhythm patterns (McDonald and Simons, 1989, p. 50). Join in with action rhymes and respond through movement to different tempos in music; Match movements to music for short periods of time; Imitate short parts of tunes accurately (Pound, L. and Harrison, C., 2003)

Table 11.6 illustrates that from 12 months to 3 years old, there are precise and detailed musical development paths that can be followed, and it also shows the huge differences within this age range. As the mapping for the musical development of children and young people who have SLD and PMLD is viewed as a continuum, it would make the *SoI* framework more comprehensive and complete if the *SoI* research team can fill in the gaps between levels 4 and 5 in the future.

Theoretical elements: timing and preference

When comparing the relevant literature and the *SoI* theoretical framework, the component 'timing' seems not only to occur at level 5 (developmental age years 4 or 5) as designed in the *SoI* framework, but also in other circumstances, especially when the students uses switch or vocalisation to complete their musical tasks, or parts of them, in time. In typical musical development (see Chapter 3), the timing element occurs with different musical tasks at different developmental ages, e.g. 'vocalisation in time to the music' at 18 to 24 months (Pound & Harrison, 2003), 'synchronise their movement to a beat in a short period of time' at 25 to 27 months (Parncutt, 2006), 'match movements to music for short periods of time' at three years old (Pound & Harrison, 2003), 'increasing ability to keep time occurred' at four years old (Moog, 1976), 'clap in time' and 'show accurate steady beat' at five years old (McDonald & Simons, 1989, p. 51), and 'perform and respond rhythmically in time' at six to seven years old (Pound & Harrison, 2003). There are differences in these musical tasks within the meaning 'in time' and the *SoI* framework may need to have a clear definition or explanation to

define the term 'increasingly in time', and maybe to find some way to include these musical behaviours' scenarios.

Another issue which draws the researcher's attention is 'develops musical preferences', which also seems to occur in other circumstances in addition to level 5 (developmental age years four or five) in the *SoI* framework. With reference to the typical musical development literature (see Chapter 3), it noted that infants show 'preference and familiarisation to a mother's voice or a musical melody which are presented repeatedly near the end of foetal life' for newborn baby (Lecanuet, 1996; Papoušek,1996), 'show preference for well-phrased music' and 'recognition of favourite song and move rhythmically in response to music' at six to 11 months (Fassbender, 1996; Trevarthen, 2002; Trehub, 2006), 'differentiate between different tempo, pitch level, voice quality, and show preference in certain music patterns' at seven to eight months (Trehub, 2006), 'preferences are already formed and not easily changed' around four to six years old (Schuckert & McDonald, 1968), many of them happen earlier than the *SoI* framework's location (R5A 'attends to whole pieces of music, becoming familiar with an increasing number and developing preferences', from the age of four or five years).

On the subject of showing musical preference, it also relates to students' ability to respond to distinctive groups of musical sounds as mentioned before. In typical musical development (see Chapter 3) it occurs at different developmental stages, e.g. 'remember musical sounds' and 'react to musical sounds' at foetal 32nd to 36th week (Hodges, 2006; Karmiloff & Karmiloff-Smith, 2003), 'response to a musical theme with conditioned and trained foetus' at foetal 37th week (Lecanuet, 1996), 'attract to a musical melody' at birth (Lecanuet, 1996; Papoušek,1996), 'stop moving and give fixed attention to the sound of singing or a musical instrument' at two months old (Michel, 1973), 'discriminate between melodies in different patterns of sounds' at four months old (Parncutt, 2006), 'discriminate different melodic patterns' at five months old (Papoušek, 1996), 'show sustained attention to mother's singing and locate sound source with accurate head turn' at six months old (Fassbender, 1996), 'can reproduce and remember the order of musical sequences and causal relationships with each other through imitated canonical order' during 12 to 24 months (Pouthas, 1996), 'start to correctly reproduce random musical sequences through imitation' at the end of the third year (Pouthas, 1996), and 'enjoy frequent repetition of the same song' at five years old (Pound, L. and Harrison, C., 2003), compared with the *SoI* framework level 4 (R4A 'recognises and

responds to distinctive groups of musical sounds – motifs' and R4C 'recognises the coherent juxtaposition of different musical motifs', 7th to 11 months onwards). Again, for the wide range of varieties and developmental stages in typical musical behaviours, the *SoI* framework may need to have a more precise definition for its wording 'develops musical preferences' to include more musical behaviours from the children and young people with complex needs.

Further research: Fill the theoretical gaps

On the theoretical part, the *SoI* team may want to revise the *SoI* framework to fill in the chronological/developmental age gap between levels 4 and 5 and perhaps levels 5 and 6 to make the *SoI* framework more complete and coherent, and to provide more precise corresponding level matching for children and young people who have SLD.

11.4.2 Operational ambiguity

There were some difficulties encountered when operating the *SoI* assessment in the fieldwork observations. One of the difficulties encountered was the fuzziness of these students' musical behaviours, and another difficulty was the ambiguity of certain situations that related to the complexity of the reality. In the teaching context, the researcher needed to take into consideration the students' disability and difficulty, their musical ability and their own unique way of communication, together with the observable result when operating the *SoI* framework. Due to the ambiguity of some concepts in the framework, certain situations could be difficult to be applied in the *SoI* framework. Several concepts may need more clarification to make the meanings clearer to the assessment practitioners.

Musical assessment for children and young people who have complex needs requires many considerations and is not an easy task. The nature of these students' physical and communicational difficulties and their individual characteristics often show ambiguity when the researcher tried to understand their musical behaviours. There are areas left for the school staff and the researcher's interpretation of individual child's musical behaviours on different levels. When a student does not carry out a specific musical task effectively, the school staff interpret the student's level of musical understanding, and their judgements also depend largely on their familiarity with the individual child.

The operational ambiguity not only happened with certain concepts in the *SoI* framework, but also with the nature of fuzziness of these students' musical behaviours. These students' musical behaviours often appeared to be ambiguous and it was hard to pinpoint the exact levels that they had reached at specified times. For examples, in week 3, J was asked to guess which child played the triangle in a guessing activity. J made several wrong guesses in the beginning, but with the teacher's verbal prompt later, he began to get the answers correct. It was hard to say whether J was able to distinguish the instrumental sound quality and recognise the direction of the sound, when facing away from the sound source, or whether J merely imitated the answer whispered by the music teacher.

Another example illustrating ambiguity was in week 3 of H and K's music lesson. When the teacher sang a canon with a student on the switch, he asked the class to distinguish between the two voices, whether they started together or whether the teacher's singing entered later. In response, H said 'yeah' to indicate that he had noticed the canon. However, there was no clear evidence showing that he understood the structural features of the song. The students' tendency also had a role to play in the ambiguity. As mentioned in section 11.3, H had a habit to say 'yeah' in response to the teacher's instructions whether he understood them or not. It was difficult to know how much H had understood the teacher's instruction and the aims of the lesson to manipulate musical material on to the computer. In addition, when offered two choices for H to make a decision, he often chose the last one he had heard from the teacher. It was not clear if he understood the musical concept (e.g. pause two or pause three) of a song or whether he had just repeated the last choice that was suggested by the teacher (see H, weeks 4, 7 and 15).

A final example illustrates the operational ambiguity from both the *SoI* framework and the nature of the students' musical behaviours. When considering the issue of timing accuracy or 'increasingly in time', K had roughly 45 to 50 seconds of waiting time before she pressed her switch in the early stages of observation. Over time, it was reduced to a few seconds. However, the researcher often wondered where the milestone point was, so that we could confidently say K's performance had made progress in reducing her waiting time but not yet 'in time'. The complexity of musical assessment does not end there because this question also relates to the frequency and stability of K's performance. For example, in week 3, K was asked to press the switch to activate the

singing of a song. She waited for about 20 seconds before she pressed the switch for the first phrase and then she pressed the switch again to link the second phrase together after 5 seconds. Therefore, in one activity, K showed two different timings for carrying out her musical task. After knowing K over a long period of time, the researcher realised that K had the habit of taking longer to perform the first task, which was very much like a 'warming up' for K, and then it became easier for her to carry out the second task quicker.

Further research: More clarification of certain concepts in the *SoI* framework

Concerning the operational ambiguity of the *SoI* framework and the nature of the music behaviours for the students, researchers may want to make further clarification about certain wordings and concepts used in the framework, and provide description and examples to accompany these concepts in each level across the three domains.

11.4.3 Scope limitation of the *SoI* framework

During the assessment process in this research, it appeared that the scope of the *SoI* framework was not big enough to cover several dimensions of musical behaviours and music education in the special school for the students. The *SoI* framework could be improved by addressing the following areas of music learning as observed in the empirical data, such as decision making for different musical tasks, movement and music, music imagination, combination of words and rhythm and musical/cognitive knowledge. For musical task decision making, the students needed to make choices (Marvin, 1998) when undertaking different musical tasks, e.g. singing, clapping or pausing when taking part in the musical activity. In addition, error detection was also used in music decision making where the teacher intentionally sang wrong words in a song and the students needed to say 'stop' when they recognised the mistakes in the teacher's singing.

For movement and music, this refers to the students who used gesture and hand signing in singing activities, moved or danced to the music, conducted in pauses of three or four, or kept a steady beat. For music imagination, the teacher asked the students to produce night time music and guided them to imagine what the music would sound like. In the combination of words and rhythm, it referred to the students' imitation (Fassbender, 1996; Papoušek, 1996; Pouthas, 1996) on the musical tasks that related to the combination of words and rhythm, e.g. imitation on chanting words and rhythmic

patterns, e.g. 'ta ti ti ta'. For musical knowledge, there were several contexts which occurred in the fieldwork observations as follows:

- Music appreciation in music listening activity, e.g. different cultural music and music history. Questions arise from the music lesson: 'Where does this music come from? Does it come from Japan or Africa?'; 'Which piece of music is older and which one is younger?'
- Musical memory on learned material or musical tasks and on auditory discrimination to distinguish the names of the instruments by their sounds and in correct order. Questions arise from the music lesson: 'What did we sing last week?'; 'Can you shout out the name of the instrument when I play it behind you?'; 'Can you tell me which instruments that I played stopped first, second and third?'

The *SoI* framework was not always easy to fit with certain teaching contexts as mentioned above, where the symbolisation, sound patterns and musical motifs recognition were not the focus for the musical engagement moment or for the whole lesson. Here are some examples: the aims in music technology lesson (see K and H, week 7); picture recognition of objects that relate to the learning material (a poem); story telling and role-play; pass on and share instrumental pictures with others; recognition of a musical venue on visual images, e.g. opera house on TV; recognise features of different instruments through visual, texture and live performance; and recognise different parts of an instrument, e.g. string and bow. In addition, in musical question and answer time, it was difficult to rate the differences between the right and wrong answers that the students gave relating to above contexts.

Further research: Integrate more aspects into the *SoI* framework

Considering the scope limitation of the *SoI* framework, researchers may want to revise the *SoI* framework to be more inclusive, and to integrate more issues and aspects in music learning for these students in future research. Music learning has more to offer apart from music pattern recognition where the *SoI* framework focused. By incorporating other musical development aspects and collaborating with professionals in psychology and child development, the *SoI* framework might integrate certain areas and provide more comprehensive pictures of music learning.

11.4.4 The limitation of using case study approach in this research project

This section looks at the limitation of using case study approach in this research. The first limitation is the question of scientific generalisation (Yin, 2003). The assessment results of the musical behaviours and development from the three students can normally only be interpreted concerning each individual and under their unique contexts and circumstances. Therefore, it should not give any strong impression that other children and young people with complex needs will definitely make progress in their musical behaviours after they have received a period of music education, even though that is what had been observed for the three students in this research. Having said that, the research results from the case studies are still useful and may to some extent be generalisable to provide understanding about other children and young people with complex needs, as Kumar (2005) noted that 'through intensive analysis, generalisations may be made that will be applicable to other cases of the same type' (p. 113). The case study results also offer potential explanations for why the students are likely to have simpler or more complex musical behaviours, because 'few human behaviours are unique, idiosyncratic, and spontaneous' (Berg, 2007, p. 296).

The second limitation of using case study approach in this research is that it took a long time and resulted in massive documents, including video and audio files. This study took 13 months in the fieldwork site and emphasised detailed and observational evidence of the multiple cases. In order to achieve reliable and high quality case studies, lengthy narrative was provided because of the strong interconnection between individual's musical behaviours, wider environmental context and students' background information. Berg (2007) noted that 'often one of them cannot be adequately understood without consideration of the others' (p. 287). Going through the field notes, video and audio files iteratively, required a large amount of time and the storage for these files was also difficult, especially for backup copies. Unfortunately, lengthy narrative may not always be of interest to the readers, and the readers may also feel 'lost' while reading the background information and the observational evidence.

11.5 Summary

This chapter firstly summarised the three case studies which had been presented in the previous chapters, with further analyses and comparison between the three students' musical behaviours and their musical development. The comparison and analyses came from both time series and cross-sectional perspectives. The overall summary and analyses suggested that all the three students showed progress in their musical behaviours and development over eight to 13 months during the research period. Their musical behaviours either moved from simpler to more complex musical behaviours, or increased behaviour consistency at higher levels in the reactive, proactive and interactive domains after participating in weekly school music lessons for a period of time.

Preliminary factors that may offer explanations for these students' simpler and more complex musical behaviours were then proposed, with the references of relevant literature. These factors could be divided into three areas: the student-related factors, the music teaching factors and the school environment factors. Many of these factors connected and interrelated together to influence these students' musical behaviours, and may form reciprocal relationships between themselves.

Finally, critiques concerning some aspects of the *SoI* framework were provided, covering several theoretical and operational issues. The limitation of using the case study approach in this research was discussed briefly. Suggestions for further research mainly followed each critique, which called for more research on music for children and young people with complex needs.

Chapter 12

Conclusion

In this concluding chapter, the researcher would like to give the overall review of this research study.

Motivation and Research Strategies

This research has conducted the first longitudinal case studies (three students altogether) through direct observations, with the intention of investigating and assessing the musical behaviours and development of children and young people who have complex needs, which has not been undertaken before.

Education for this group of children only occurred following the Education (Handicapped Children) Act 1970. Ockelford (2008) noted that our understanding of music education for children and young people with complex needs is still in its early stages. The starting point of this whole research study emerged from the motivation of the researcher to fill the current research gap, and relevant research questions were therefore designed accordingly (see Chapter 5).

As presented in chapters 1 and 5, the research questions were:

- Is it possible to systematically assess and evaluate the musical behaviours and development of children and young people with complex needs over a sustained period of time, based on the theoretical framework (*SoI* framework) – and how could this be done?

- What is the nature of the observed musical behaviours and development of children and young people with complex needs over a given period of time?

The first research question has been answered by the integration of the *SoI* framework (see Chapter 4) as the theoretical research foundation, a newly developed assessment procedure (see Chapter 6) as the operational tool, and the case study approach (see Chapter 5) as the overall methodological strategy, with the embedded ethnographic fieldwork to provide detailed contextual background information of the longitudinal case studies in this research.

As one of the original contributions of this research, the newly developed assessment procedure adopted part of the *SoI* framework as the theoretical foundation (for steps 3, 4 and 8), and combined them with the researcher's original design of raw data table in step 5, the frequency distribution table in step 6, and stack and concentric profiles in steps 7 and 8 with gradual colour coding to represent the different levels of 'concentration' (which depended on the relative frequency of occurrence of musical behaviours).

This integration demonstrated practically that the current *SoI* theoretical framework could be further developed into the new assessment procedure as an operational tool, and by which the longitudinal case studies in this research could be conducted to empirically map out the pattern of an individual child's musical behaviours and development over a sustained period of time (see Appendix M; Cheng *et al.*, 2009).

Research Findings and Discussions

For the second research question, the main findings in this research suggested that, firstly, it was possible to evaluate the changes and progress of the musical behaviours with the children and young people with complex needs, using the newly developed assessment procedure over eight to 13 months.

Secondly, when comparing the three students' musical behaviours, from both a time series perspective and cross-sectional perspective, the two students who had SLD appeared to have made more progress in their musical behaviours over a period of time than the student who had PMLD, whereas the student with PMLD had more fluctuated performance pattern than the other two students with SLD. The student who had PMLD sometimes showed regression in her musical behaviours and developmental profiles, and she exhibited the simplest musical behaviours on level 1 in all reactive, proactive and interactive domains over two terms.

Thirdly, looking at the variety of these students' musical development paths, it appeared that the learning of these children over a sustained period of time was not a smooth progress, but rather an iterative motion, moving forward and backward. They might even involve a period of regression, as seen in one of the students. All three students demonstrated a wide variation and range of musical behaviours over eight to 13 months, which form a feature for the three students across the three domains, and this might be due to the nature of fuzziness in the students' musical behaviours, the music teacher's pedagogies and curriculum design, or other relevant factors.

However, the overall summary and analyses suggested that all three students showed different degrees of progress in their musical behaviours and development during the

research period. Their musical behaviours either moved from simpler to more complex musical behaviours, or increased behaviour consistency at higher levels in the reactive, proactive and interactive domains after participating in weekly school music lessons for eight to 13 months.

Preliminary factors that may offer potential explanations for these students' simpler and more complex musical behaviours were then proposed, with the references of relevant literature. Further research into this list of preliminary explanatory factors may help the music practitioners to design their music curriculum and to inform their teaching strategies. It may also enhance deeper understanding of the nature of musical behaviours for children and young people with complex needs.

Finally, critiques concerning some aspects of the *SoI* framework were provided, offering feedback on both theoretical and operational grounds. These were followed by a brief discussion of the limitation of using the case study approach in this research (see Chapter 11). After each critique, suggestions for further research were also provided, with the intention to help the future development of the broad *SoI* research programme and to call for more research on the music for children and young people with complex needs.

Concluding Remarks

Music has an important role in the lives of children and young people who have complex needs. Through the newly accumulated empirical data, analyses, and findings from the longitudinal case studies, it has been demonstrated that the current *SoI* research programme can be adopted practically, through the newly designed assessment procedure, to further our understanding of the musical behaviours and development of

these students.

For the schools, Marvin (1998) noted that curriculum content must be guided by statutory requirements and the needs of the pupil as defined by the interdisciplinary team of professionals and the pupil's parents (p. 118). The researcher therefore suggests the staff in special schools to include professional music practitioners into multidisciplinary teams to coordinate with teachers of other subjects and therapists, to reveal these students' uneven profiles in order to work with their strengths more positively, and to work together towards the ongoing development of these children and young people's maximum potential and benefits, by looking beyond their disabilities and difficulties from various subject angles.

It is also hoped that the management teams in special schools may become more aware of the intrinsic musical values for students with complex needs, in the similar way that they recognise the extrinsic musical values which are important to promote and maintain these students' well-being.

Finally, for the policy makers, the involvement of music practitioners, utilising the *SoI* framework, in the pre-enrolment multidisciplinary team to reveal these children and young people's uneven profiles, might provide better educational opportunities for them.

As Marvin (1998) mentioned, children and young people with SEN need to be encouraged to 'pursue highly individualised objectives in meaningful and sociable contexts with the opportunity to progress at their own rate' (p. 123), and music education will help to add another dimension in these students' musical life when considering their overall potential and the enrichment of the quality of their life.

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Evangeline Kai-Wen Cheng

Appendix A The *SoI* framework elements

Appendix B
Case study voluntary informed consent form

Purpose of the case study
I am a full-time doctoral student at the Institute of Education in the School of Arts and Humanities. My research focus is on the musical behaviours and development of children and young people with complex needs. My research is drawing on, and related to, an Esmée Fairbairn Foundation-funded project at the Institute called 'Sounds of Intent' (www.soundsofintent.com), part of a series of studies involving music and special education. I am using the musical behaviours and development protocol from this project in my own study. This has been created in consultation with special needs music teachers and music therapists. The research is based at the Institute of Education University of London.

The study
Children's participation in this research is entirely voluntary.

The study involves direct observation via note taking and some video recording, as well as informal and formal interviews with the music teacher, other members of staff and feedback from the students themselves (where possible). You, as parents, will also have the opportunity to talk about musical activities in your own child's life as you wish.

All data collected will be anonymised according to the British Educational Research Association (BERA) in their Ethical Guidelines (2004), with information used solely for the purposes intended. Details from the case study will be kept strictly confidential and will be available only to members of the research team. To protect the confidentiality of the students and other participants, as well as maintain anonymity, names or other identifying data will not be recorded in disseminated reports. Excerpts from observations, feedback conversations and interviews that take place as part of the research will be submitted as part of the final report. Video data will only be shared with moderating bodies.

Refusal or withdrawal of participation
If you agree to participate in this programme, your participation and that of your child is entirely voluntary. You are equally free to withdraw from the study, or elements of it, at any time.

Consent to participate in the study
On behalf of my child, I hereby agree to participate in the case study.

Please sign and date this form to show that you have read and understood the information.

.....(signed)
.....(printed)
.....(date)

Please keep one signed copy for your reference and return the other to:

Evangeline Cheng
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If you have any questions about this research, you can contact Professor Graham Welch at Institute of Education (020 7612 6503/6550) or correspond with the researcher directly at evangelinecheng@gmail.com or on 079 1538 0643.
Thank you.

Appendix C

Semi – structured interview questions

Thank you for taking part in the interview. Can I first of all assure you that you will remain completely anonymous and no records of the interview will be kept with your and the children's name on them.

1. Your role in relation to the child
   - How long have you been working with the child?
   - What is your role in relation to the child?

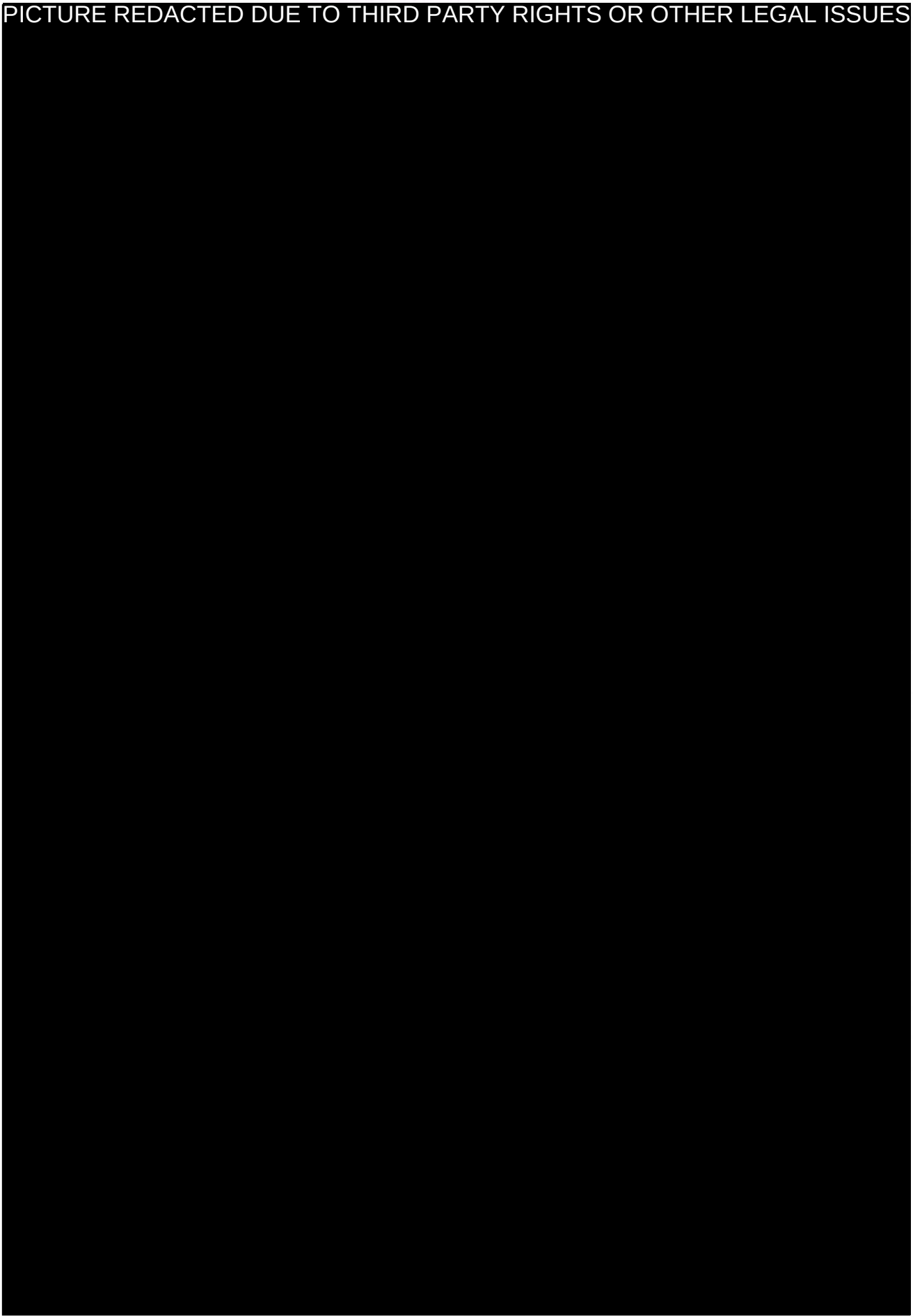
2. Your general observation of the child
   - What is the child like to work with?
   - What are the strengths of the child? (In what situation does the child respond most positively?)
   - What are the barriers to the child's learning? (internal- i.e. learning difficulty or external – i.e. lack of suitable instruments)
   - How does the child communicate?
   - What do you normally do to engage with the child?
   - Have there been any major changes in the child's life since you have been working with him/her? E.g. health/medical conditions, family issues, etc.
   - How would you describe the child's general development over time? (What are the changes in the child's physical, social, emotional, cognitive, and communication development?)

3. Musical level of engagement (in music activities or activities that involve musical elements)
   - Please describe the child's daily music experiences in the school.
   - Do you know anything about the child's music experiences at home?
   - Do you think that music play a significant role in the child's life or not? Why?
   - Do you know whether there are particular types of sound or music that the child responds to strongly (likes or dislikes)? E.g. sounds (different sound quality; soft or loud) or musical elements (chanting, poem reading and story telling in rhythmical way; high or low pitch) interests the child?
   - How does the child show his/her engagement with music? (vocalization, body movement, instrumental playing, stilling or other expressions)
   - Are there certain contexts in which they are attracted to music?
   - Can the child play any instruments? How do they make use of them?

4. Music in a wider learning environment
    - Do you use sounds or musical elements when working with the child in non-musical contexts?
    - What do you do when using the musical elements?
    - Does the child find music helpful in wider learning? If so, how? (concentration; memory; imagination; motivation; awareness of the presence, needs and expectations of others)
    - To what extend do you see music helping in the child's general learning or to the subject that you teach?

Can I finally ask you if you think there is any aspect of your experience in working with the child that has not been covered in this interview? I would like to reassure you that you and the child will remain completely anonymous. Thank you very much for helping me and giving up your time.

Appendix D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Appendix E

Weekly record of music

Date	Main learning experiences	Observations of pupils learning
23 Jan 06 3LS	Participation in group song using switches; Awareness of phrasing; Developing "inner hearing" and use of the "thinking voice" Internalising phrasal structure of song material	Excellent participation by all students[...] Students able to wait their turn to switch in correct place and order. [I and J] needed a little support. (O and H) were independent; F needed a lot of support. All students used two switches in correct sequence; Good evidence of thinking voice and internalisation of song structure.

Appendix F

Annual report of J

Date: July 2007	
Other curricular areas could include: history; geography; music; physical education	
[Pictures of the child]	J has made excellent progress in music. He takes part very enthusiastically in greeting and "hello" songs, usually preferring to use his voice rather than a switch. He quickly volunteers himself to be "leader" in music activities. He can manipulate small instruments and investigate their sounds, and he tries hard to control or change the sound made. J can make a choice between two instruments and has explored sounds on a keyboard using music technology to facilitate sequence and change sound patterns. J's enthusiasm and motivation in music are very good. It has been a real pleasure to watch his progress this year. Well done J!

Appendix G

The music teacher's assessment

Name	Short eye contact	Prolonged eye contact	Looks at instrument	Manipulates/ explores instrument	Uses instrument for its purpose	Joins in with leader in exploring sound source	Takes turns with leader in exploring sound source	Shows pleasure in activity

SWITCHING

Name	Uses switch with support	Uses switch independently	Sequences phrases on a switch	Switch-sequences with P or T or TA	Works with partner using switch

INSTRUMENTAL PLAYING

Name	Makes sounds on an instrument	Controls sounds on an instrument	Plays rhythmically	Plays a melody on an instrument

MUSIC TECHNOLOGY

Name	Uses music tech to select sounds	Uses music tech to control, order and change sounds	Selects loops to go with a piece of work	Evidence of form and structure in music tech	Uses music tech in composing structured pieces	Uses music tech in composing, improvising or with exploratory pieces

SINGING AND PITCH

Name	Distinguishes between different kinds of voices	Joins in with part of song	Shows evidence of pitch matching	Shows evidence of pitch in song shapes	Has found a singing voice of some kind	Sings well in tune	Sings in two-parts, or in a round

COMPOSING

Name	Explores sound makers	Chooses sound makers for a particular purpose or effect	Copies a given phrase	Responds to a given phrase	Extends own work by repeating	Extends work by variation	Orders and selects sounds

LISTENING

Name	Attends to sound source by turning towards it	Says or points to where a sound comes from	Recognises instrument by sound alone	Recognises known music material from rhythm alone	Recognises known song by melody alone	Polyphonic hearing	Harmonic awareness

RHYTHMIC WORK – VOCAL/SGs/INSTRUMENTAL

Name	Joins in with parts of rhythmic speaking	Recognises learned rhythmic pieces	Attempts to beat time, or perform rhythmic motif	Copies rhythmic motif	Performs a response to a rhythmic motif	Shows coordination	Rhythmic independence

Appendix H

Other extra-curricular musical activities in the school

There were also a few individual performing groups invited to the school. During African black history week, a group of three came to perform African stories to the whole school. The acting, dancing, and singing grabbed many children's attention, and interest, as some of them asked for 'just one more story' at the end of the show. In the music lesson later that afternoon, the music teacher reviewed briefly one of the stories, and various animal sounds, for the children before they got on with their work.

A pantomime story teller and actor came into the school and had a workshop on 'Jack and the Beanstalk' with all the primary classes together, and with one class from the secondary department. The workshop was for half a day – using role play, various sound effects, and a small group presentation acting different scenes. It seemed to fit well with the 'Jack and the Beanstalk' musical that the secondary department presented at the end of the year.

An opera company also came to perform the opera 'Carmen' to the whole school. The music teacher spent two to three weeks familiarising the children with its background. He told the Carmen story, used a video tape, and role played with the children and young people, to reproduce parts of the various scenes. For example, one child pressed the switch to reproduce the bull's angry sounds while another child played as the bullfighter.

These activities helped the children to become familiar with the elements of the music and the story. The children and young people reacted enthusiastically towards the drama play and it appeared to the researcher that it encouraged them to become more involved and to respond in a more positive way.

In the school, it seemed to be a tradition that every December (which was observed by the researcher in 2006 Dec and 2007 Dec) the whole school went to a nearby Anglican church to sing Christmas carols and listen to the Christmas story, along with other mainstream school children from the neighbourhood. Although TAs and the children have a range of different religious backgrounds, given the diversity of their ethnicity, the Christian Christmas event seemed to be an established part of this school's annual activities, and was enjoyed by all.

During the Christmas season, the directors of the primary and secondary departments also organised a disco dancing event for the whole school. The children were very

excited and interacted well with the staff in the dancing. Loud and strong beat popular music was played and shimmering disco lights were put on. The children seemed to have lots of fun laughing, vocalising, and moving to the music with the staff. The event was designed to be flexible for the children and they had a choice either to join in or go out to do other curricular activities during this time. The children who stayed in the hall reacted positively to the music shown by their body movements, their exclamations of delight, and their obvious enjoyment of the whole event.

The Nutcracker show

It was also a tradition that the primary department did a show every Christmas. In December 2007, the primary department performed 'The Nutcracker' Suite. The main organisers for the show were the primary class teachers. Although the music teacher was not much involved in the planning and production, the music lessons were used for rehearsals. Each class had a different scene to perform.

A narrator told the story while introducing different characters which were acted by the different classes. The children came in turn to perform their dancing or to walk on to the stage with the assistance of the school staff. The Nutcracker music was specially selected and played to help the children's dancing and to frame the story.

Appendix I

Weekly coding, comments and analyses for the musical behaviours and development of J

Musical behaviours and development of J in phase one: weeks 1 to 14

Week 3

In week three, J responded to the 'hello song' through using vocal sounds. J had responsive and direct intentional vocalisation to the teacher's direct face-to-face greeting in singing the 'hello song'. He vocalised with the teacher's singing and he could sing his name clearly and appropriately in the 'hello song'. It seemed that he knew the music sequence and understood when he needed to respond in the song (coded within the *SoI* framework as R4A, P4A, I4B[1]).

In a musical activity called 'Coo, coo, where are you?' the teacher wheeled J to sit in front of the class and turned him around. J was asked to guess which child played the triangle when the teacher sang 'Coo, coo, where are you?' (s m ss m). J had several wrong guesses in the beginning and then he began to get the answers correct. It was hard to say whether J was able to distinguish the instrumental sound quality or recognise the direction of the sound when facing away from the sound source. However, he was able to imitate the teacher in saying the child's name who played the triangle (coded R3A, I2D). J also allowed the music teacher to hold his hands to tap a rhythmic pattern (♩ ♩ ♫ ♩) on his tray while the teacher sang 'Coo, coo, where are you?' (R3A, I2C). In a similar group activity, J formed fragmentary responses through his vocalisation along with the teacher's singing (R3A, I3A).

J enjoyed laughing at certain social contexts. For example, he giggled at the teacher's exaggerated animal sounds while chanting the rhythmic sequence: quack, quack, quickie quack! (♩ ♩ ♫ ♩) and took his hand to point to the rhythmic card (R2B, P2B, I2A). When given enough time, J was able to respond and said the last word of the rhythmic chanting through imitating the teacher's sounds (R3C, P3A, I3C).

[1] Where an observation embraces more than one type of categorisation, then more than one SoI framework number and level are indicated.

A few times in the lesson, in recognition of musical symbols, J was able to say the first and last word 'ta' of the rhythmic sequence on 'ta ta ti ti ta' (♩ ♩ ♫ ♩). Especially with the last word 'ta', J would say it with a loud, expressive and confident voice which probably showed his awareness at the ending of the musical phrase (R4A, P4A, I4A). When everyone clapped him, he screamed with excitement and delight. However, his performances on this task fluctuated in focus on the music lesson.

The teacher asked another child to distinguish and make a connection between the rhythmic notation (♩ ♩ ♫ ♩) and chanting 'ta ta ti ti ta' by offering her three different rhythmic notations from which to choose. When the teacher read out the correct rhythmic notation card while tapping the rhythm with a stick, J joined the activity with his vocalisation and imitated the last word 'ta' with more consistency (R3D, I3C). In the 'goodbye song', when the teacher sang 'goodbye' to J, he responded 'goodbye' back to the teacher (R3A, P3A). Following the teacher's instruction, J also interacted independently with his peers by saying 'goodbye' within the structure of the song (R4A, P3C, I4A). The following table summarises the coding in week 3 of J:

Table I.1 The raw data table of J in week 3

		Domain Categorisation			Element Matching					
					R		P		I	
WK	OBS	R	P	I	Score	Element	Score	Element	Score	Element
03	J001	1	1	1	4	A	4	A	4	B
03	J002	1		1	3	A			2	D
03	J003	1		1	3	A			2	C
03	J004	1		1	3	A			3	A
03	J005	1	1	1	2	B	2	B	2	A
03	J006	1	1	1	3	C	3	A	3	C
03	J007	1	1	1	4	A	4	A	4	A
03	J008	1		1	3	D			3	C
03	J009	1	1		3	A	3	A		
03	J010	1	1	1	4	A	3	C	4	A

The following stack profile (see Chapter 6 for how the stack profile is created) summarises the musical development mapping in week 3 of J. His musical behaviours ranged from level 2 to 4 in each of the reactive, proactive and interactive domains. The modes for the reactive domain located at level 3, the proactive domain also at level 3 and the interactive domain at level 4 respectively (demonstrated by the darker shading for these codings).

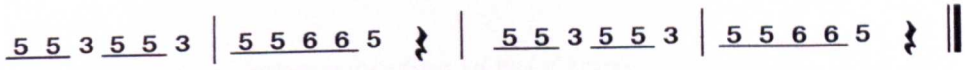
WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
03	R1		0	P1		0	I1		0
03	R2	1	10	P2	1	17	I2	2	22
03	R3	6	60	P3	3	50	I3	3	33
03	R4	3	30	P4	2	33	I4	4	44
03	R5		0	P5		0	I5		0
03	R6		0	P6		0	I6		0
03	Total	10	100	Total	6	100	Total	9	100

Fig. I.1 Stack profile of J in week 3

Week 5

In week five, while having physical help from the teacher to play the hand cymbal, J partially imitated the words 'Coo, coo, where are you?' followed by the teacher's singing. He could sing the words 'are you' once within the musical phrases when the teacher left a gap for him to sing (R4B, P4B, I4A). J participated in singing the song which the teacher had taught two weeks ago. He also seemed to recognise and react to simple melodic sequence 'sol mi sol sol mi' (in rhythmic pattern ) by singing the last 'mi' confidently at the end of the phrase, twice (R4B, P4A, I4A).

In another musical activity, the teacher introduced a new song 'little bird' into the group.



(Little bird, little bird, sing a song for me, I'll sing too, just like you, singers we shall be)

J pressed the switch in time to link the different music motifs together which also generated his direct responsive movement (R4B, P4B, I4B). When it was another's turn to press the switch, he vocalised along with the singing in time with the switch (R4A, P3A, I3A). In an individual activity, J pressed the switch to activate the singing of the song 'little bird' which was pre-recorded in different music motifs, and was followed by the teacher's instruction (R4B, P4B).

When the teacher recorded the rhythmic patterns of the song 'little bird' on the drum, J pressed the switch well in time to link different rhythmic patterns (R4B, P4B). After that, the teacher added more drumming by playing the beat (♩ ♩ ♩ ♩) while asking J to press the switch to activate the singing of the song 'little bird'. There was a longer pause in J's switching (R4A, P3D). A possible reason for this could have been that there were too many things going on at the same time for him, or that while he was listening to the teacher's drumming, he had lost concentration and had forgotten about his own part.

J would say 'me!' and volunteered to participate in activities. With many firm and positive encouragements given by the music teacher, J seemed to begin to respond more consistently to the teaching instructions and also with his interaction in either singing or pressing the switch. J showed a clear and strong intention for communication and seemed to recognise the sound patterns in relation to symbolised rhythms. For example, J chose to be 'ta' (♩), which was a recorded drum sound on the switch. One child represented 'sh' (𝄿) to play on the cymbal and the teacher was being 'ti ti' (♫) played on the hand drum. Three of them took turns in playing the rhythmic sequence of 𝄆 ♫ ♩ ♫ ♩ | ♫ ♫ ♩ 𝄿 𝄇 (ti ti ta, ti ti ta, ti ti ti ti ta sh). J took his turn well with the teacher and with his peer (R4C, P4B, I4D).

In switch work, J was able to press different coloured switches to produce the whole piece of the rhythmic sequences – on hearing different instrumental recordings followed by the teacher's verbal prompting and finger pointing (R4D, P4C, I4D). For example, ♫ was recorded on a red switch, ♩ was on a blue switch, and 𝄿 was on a green switch. J pressed these switches according to the rhythmic sequence 𝄆 ♫ ♩ ♫ ♩ | ♫ ♫ ♩ 𝄿 𝄇 in good timing. He was awake throughout the music lesson and he got three ticks on the 'happy side' in the session.

In learning to sing the musical notes of the song 'little bird', the teacher held and moved J's hand up and down to make a connection at different heights while singing the notes 'sol' and 'mi'. The music teacher also demonstrated the hand signs for these notes. J vocalised when the teacher asked him to participate (R2D, P2C). The teacher sang the notes of the whole song 'little bird' while moving J's hand up and down to imitate the

hand signs on 'sol sol mi, sol sol mi, sol sol la la sol' (in the rhythmic pattern ) to give him the sense of high and low notes in relation to the pitch. J sang the note 'sol' at the end of the musical sequence with the teacher, more consistently, and he would occasionally sing 'la' and 'mi' (R4B, P4A, I4A).

The teacher wrote the notes 'Sol sol mi, sol sol mi, sol sol la la sol' on the board and held J's hand to point to the notes while he was singing them. J then sang the last note of the phrase 'sol' with the teacher quietly (R4B, P3A, I3C). The following table summarises the coding in week 5 for J:

Table I.2 Week 5 raw data table for J

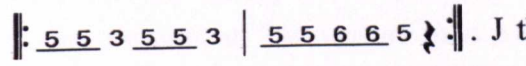
		Domain Categorisation			Element Matching					
					R		P		I	
05	J011	1	1	1	4	A	3	C	2	D
05	J012	1	1	1	4	B	4	B	4	A
05	J013	1	1	1	4	B	4	A	4	A
05	J014	1	1	1	4	B	4	B	4	B
05	J015	1	1	1	4	A	3	A	3	A
05	J016	1	1		3	A	3	A		
05	J017	1	1		4	B	4	B		
05	J018	1	1		4	B	4	B		
05	J019	1	1		4	A	3	D		
05	J020	1	1		3	D	3	A		
05	J021	1	1		3	D	3	D		
05	J022	1	1	1	4	B	3	D	4	B
05	J023	1	1	1	4	C	4	B	4	D
05	J024	1	1	1	4	D	4	C	4	D
05	J025	1	1		2	D	2	C		
05	J026	1	1	1	4	B	4	A	4	A
05	J027		1	1			2	B	2	B
05	J028	1	1	1	4	B	3	A	3	C

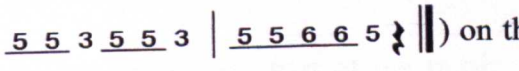
The following stack profile summarises the musical development mapping in week 5 for J. His musical behaviours ranged from level 2-4 in the reactive, proactive and interactive domains. The modes for the reactive domain located at level 4, the proactive domain at level 3 and 4 and the interactive domain at level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
05	R1		0	P1		0	I1		0
05	R2	1	6	P2	2	11	I2	2	18
05	R3	3	18	P3	8	44	I3	2	18
05	R4	13	76	P4	8	44	I4	7	64
05	R5		0	P5		0	I5		0
05	R6		0	P6		0	I6		0
05	Total	17	100	Total	18	100	Total	11	100

Figure I.2 Stack profile week 5 of J

Week 6

In week 6, J recognised the melody of the song 'little bird' immediately and began to smile when the teacher started singing 'bla bla bla' on the melody  . J then started to vocalise on the second musical phrase of the teacher's singing and showed recognition of the tune (R4D, P3A). When the teacher sang the words of the song 'little bird, little bird, sing a song for me, I'll sing too, just like you, singers we shall be', J vocalised simultaneously with the teacher (R4A, P3C, I2C).

When the teacher recorded his singing on the switch, J also responded with vocalisations along with the teacher's singing (R4A, P3A). J anticipated each musical phrase by linking them together through pressing the switch in good timing and vocalising quietly along with it (R4B, P4B). When it was his turn to use the switch, the teacher held J's hand to help him tap on his tray for the first musical phrase on the rhythmic pattern (), J then again pressed the switch to activate the singing part (I'll sing too, just like you, singers we shall be ) on the switch by himself with good timing and turn taking (R5A, P5A, I4D).

J initiated to use one word (i.e. yeah) to communicate intentionally and confidently. When the teacher referred to an activity which they had done a couple of weeks ago on the notes of 'sol, mi, sol sol mi' ('coo, coo, where are you?'), the teacher commented that J had showed the class some very good hand signals. He asked J to do so again and J vocalised by raising his hands up in the air (R4B, P3A).

In a singing activity, when the teacher sang the notes of the song 'little bird' on 'sol sol mi, sol sol mi, sol sol la la sol, sol sol mi, sol sol mi, sol sol la la sol' (5 5 3 5 5 3 | 5 5 6 6 5 𝄽 | 5 5 3 5 5 3 | 5 5 6 6 5 𝄽 ‖), J participated actively and joined in singing on 'sol', 'mi' and occasionally on 'la' in tune and in time with the teacher's singing (R5A, P5A, I5A). He seemed to understand the concept of hand signs such as 'sol', 'mi' according to the different heights. When the teacher moved his hands up and down while singing the notes, he responded actively. When it was another's turn, he would look and turn his head towards the person for a fleeting moment.

In a 'singing piano' activity, J volunteered to be represented as a note 'mi' and he responded positively when the teacher asked them to practise once more. Three children were selected and appointed by the teacher to represent individual notes as 'sol', 'mi, or 'la' by the teacher. The teacher then pointed at different children to sing their notes in the melody sequence of 'little bird'. When the teacher pointed to J, he sang his note 'mi' in taking turns with the other children well. His singing was in good timing and in tune – before he started to giggle and laugh on the second round (R5A, P5B, I4D).

In a rhythmic chanting activity, the teacher recorded the poem 'diddle, diddle, dumpling, my son John, went to bed with his trousers on; one shoe off and one shoe on, diddle, diddle dumpling, my son John' by Mother goose's rhymes in the rhythm patterns 1111 1 1 1 1 | 1 1 1 111 1 1 | 1 1 1 1 1 1 1 1 | 1111 1 1 1 1 ‖.
J pressed the switch to link four phrases in the rhythmic poem, chanting together in good timing (R4B, P4B).

In J's instrumental playing, he needed full 'hands on' support and encouragement to play the instrument while taking turns with the other children. The teacher played music for two parts. One part of the music 𝄆 5 · 2̇ 2̇ · 7 1̇ · 2̇ 3̇ · 2̇ | 2̇ · 3̇ 2̇ · 1̇ 7 · 6 5 𝄇 is the skipping music. The other part of the music 𝄆 7 7 1̇ 2̇ 6 6 7 5 | 7 7 1̇ 2̇ 6 6 5 𝄇 is the marching music. When the teacher played the music on the piano, the children were asked to distinguish which part of the music was being played. J reacted well when he heard the skipping music (P2A, I2A). When the teacher played the skipping music on the piano, J was helped by a TA to play

a shaker in time with the teacher. He had taken turns with another child on a scraper, fully prompted, when the teacher played the marching music (R3D, I2A). J seemed to have good eye contact with those who worked with him, and he gave big smiles on many of occasions. The following table summarises the coding in week 6 for J:

Table I.3 Week 6 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
06	J029	1	1	1	4	B	4	A	4	D
06	J030	1	1		4	D	3	A		
06	J031	1	1	1	4	A	3	C	2	C
06	J032	1	1		4	A	3	A		
06	J033	1	1		4	B	4	B		
06	J034	1	1	1	5	A	5	A	4	D
06	J035	1	1		4	B	3	A		
06	J036	1	1	1	5	A	5	A	5	A
06	J037	1	1	1	5	A	5	B	4	D
06	J038	1	1		4	B	4	B		
06	J039		1	1			2	A	2	A
06	J040	1		1	3	D			2	A

The following stack profile summarises the musical development mapping in week 6 for J. His musical behaviours ranged from level 3 to 5 in the reactive domain and level 2 to 5 in the proactive and the interactive domains. The modes for the reactive domain located at level 4, the proactive domain at level 3 and the interactive domain at both level 2 and level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
06	R1		0	P1		0	I1		0
06	R2		0	P2	1	9	I2	3	43
06	R3	1	9	P3	4	36	I3		0
06	R4	7	64	P4	3	27	I4	3	43
06	R5	3	27	P5	3	27	I5	1	14
06	R6		0	P6		0	I6		0
06	Total	11	100	Total	11	100	Total	7	100

Figure I.3 Stack profile week 6 of J

Week 7

In week 7, J recognised the song 'little bird' as soon as the teacher started singing it and he intentionally made patterns in sound by imitating his singing. J interacted with the music teacher and teaching assistants by using his vocal sounds actively when recognising the motif patterns in the song. J sang one to two words, in tune and in time, along with the teacher's singing. For example, J sang 'you' when the teacher sang 'I'll sing too, just like "you", singers we shall be'. J also sang 'me' quietly and simultaneously when the teacher sang 'little bird, little bird, sing a song for "me" on the second round (R5A, P5A, I5A).

In this week, the teacher used a software called 'GarageBand'[2] and recorded the song 'little bird' split into two separate phrases – played by grand piano sound and a bass accompaniment on the computer. The objectives for the music lesson were, firstly, to open the GarageBand with one click and listen to different parts of the song, and secondly, to drag the two phrases together and drag the bass part underneath the phrases to fit the song. Finally, it was to change the original piano sound to different instrumental sounds in the two phrases. Two children shared one computer.

When the teacher changed the grand piano to rock guitar sound, J shouted 'Yeah!' and vocalised to parts of the song (R3D, P3D). Not only would J show his preferences and likes, he was also able to express his dislikes by saying 'no' to the instrumental sounds which his group had chosen (R3C). In group demonstration, J listened to the other groups' work and vocalised to the song in tune for a few notes and then waved his hands as a conductor (R4A, P3A). However, after a long wait, he seemed to get bored and vocalised to made a sound to attract the teacher's attention (P2C, I2B).

Later on, J vocalised excitedly towards the song 'little bird' played by the rock guitar. He recognised the melody of the song and showed great awareness of the timbre on the chosen instrument by his vocal enthusiasm throughout the song (R5A, P5A). J also reacted well when the melody was played by the sounds from the electric guitar (R4D, P4C). This behaviour did not happen with the bass accompaniment. Overall, J did not seem to respond well to the music technology concerning the objectives in arranging and choosing instruments on the computer. His moments of musical engagement in this session were few, and for much of the time he just sat by himself and sucked his thumb. The following table summarises the coding in week 7 for J:

[2] GarageBand is a software from MacBook (http://www.apple.com/ilife/garageband/). It enables the user to record, edit, and mix a song exactly as he/she wanted in good sound quality.

Table I.4 Week 7 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
07	J041	1	1	1	5	A	5	A	5	A
07	J042	1	1		3	D	3	D		
07	J043	1			3	C				
07	J044	1	1		4	A	3	A		
07	J045		1	1			2	C	2	B
07	J046	1	1		5	A	5	A		
07	J047	1	1		4	B	4	B		
07	J048	1	1		4	D	4	C		
07	J049	1	1		4	B	4	A		
07	J050		1	1			3	D	2	C

The following stack profile summarises the musical development mapping in week 7 for J. His musical behaviours ranged from level 3 to 5 in the reactive and level 2 to 5 in the proactive and the interactive domains. The modes for the reactive domain located at level 4, the proactive domain at level 3 and 4 and the interactive domain at level 2 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
07	R1		0	P1		0	I1		0
07	R2		0	P2	1	11	I2	2	67
07	R3	2	25	P3	3	33	I3		0
07	R4	4	50	P4	3	33	I4		0
07	R5	2	25	P5	2	22	I5	1	33
07	R6		0	P6		0	I6		0
07	Total	8	100	Total	9	100	Total	3	100

Figure I.4 Stack profile week 7 of J

Week 10

In week 10, J distinguished his peers' names by saying 'no' when the teacher intentionally sang the wrong name of a child to elicit the child's response (P3D, I2D). At times, J's eyes followed the switch when it was making certain sounds and being moved away from his tray (R2A). In a musical activity, the music teacher sang a song where every child represented different animals and took turns in singing the sounds of the animal. For example:

The teacher sang: 'brought me a hen and the hen pleased me, bed my hen in yonder tree, the hen went... (2 2 2#4 #4 #4 | 2 3 4 – | 2 3#4 6 | 6#4 2 · 2 | 2 3)'

J (pressing the switch): cluck, cluck, cluck, cluck.

Teacher: 'the dog went... (2 | 2 3)

K: bow-wow-wow (#4 #4 #4)

Teacher: 'and the cat went (2 2 | 2#4)...'

E: fiddle-i-dee (6 6#4 | 2 – – – |)

J controlled his movements and pressed the switch to generate the hen's sound through repetition in good timing (R4D, P4B, I4D). When the song went up to six animals (a cat, a dog, a hen, a cow, a sheep and a pig), J was able to join in the whole song, with good timing, through pressing the switch when it was his turn (R5A, P5A, I4D). When the teacher played the melody on the piano without singing the words and wanted the children to put in their own sounds, J listened well and seemed to know whose turn was next and he was then able to press his switch in the correct order and in time (R5B, P5A, I4D).

Under the teacher's instruction, when practising a rhythmic pattern 'ti ti ta' (♫♩), J copied and shouted out 'ti...ta' twice, showing good anticipation and engagement (R4B, P4A, I4A). To develop the activity further, the teacher played a short piece of music 𝄆 5 5 6 7 – | i 7 6 7 7 | 5 5 6 7 7 | i 7 6 5 – 𝄇 and asked the children to shout out 'ti ti ta' (♫♩) at the ending of the song or on the last bar of the musical phrase. When the teacher recorded the 'ti ti ta' on the switch and asked J to press it, he did so for the last bar of the musical phrase. He seemed to understand the structural features of the piece of music (R5B, P5A, I5A).

When working with another child who pressed the switch to produce the piano playing on the melody, the teacher played the piano for accompaniment. On the last bar of the musical phrase, J pressed the switch well when taking his turn and in ensemble, with others (R5B, P5A, I5B). It sounded like real ensemble music while J maintained his independent part. The following table summarises the coding in week 10 for J:

Table I.5 Week 10 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
10	J051	1	1	1	5	A	5	A	4	D
10	J052		1	1			3	D	2	D
10	J053	1	1	1	4	D	4	B	4	D
10	J054	1	1	1	4	D	4	B	4	D
10	J055	1	1	1	5	A	5	A	4	D
10	J056	1	1	1	5	A	5	A	4	D
10	J057	1	1	1	4	D	4	D	4	D
10	J058		1	1			3	D	2	D
10	J059	1	1	1	5	B	5	A	4	D
10	J060	1	1	1	4	D	4	A	4	B
10	J061	1	1	1	4	D	4	D	4	D
10	J062	1	1	1	5	B	5	A	4	D
10	J063		1	1			3	D	2	D
10	J064	1	1	1	4	B	4	A	4	A
10	J065	1	1	1	5	B	5	A	5	A
10	J066	1	1	1	5	B	5	A	5	B
10	J067	1	1	1	5	A	4	A	4	D
10	J068	1	1	1	5	B	5	A	4	D
10	J069	1	1		3	D	3	D		
10	J070	1			2	A				

The following stack profile summarises the musical development mapping in week 10 for J. His musical behaviours ranged from level 2 to 5 in the reactive and interactive domains and level 3 to 5 in the proactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 5 and the interactive domain at level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
10	R1		0	P1		0	I1		0
10	R2	1	6	P2		0	I2	3	17
10	R3	1	6	P3	4	21	I3		0
10	R4	6	35	P4	7	37	I4	13	72
10	R5	9	53	P5	8	42	I5	2	11
10	R6		0	P6		0	I6		0
10	Total	17	100	Total	19	100	Total	18	100

Figure I.5 Stack profile week 10 of J

Week 11

In week 11, J vocalised simultaneously with the teacher in the animals' song and emphasised his singing on 'bow-wow' and 'dee' well (R5D, P5A, I5A) (see week 10 for an example of the song). When the teacher reviewed the sequence of the song while assigning different animal roles to the children, J vocalised some parts of the song with the teacher, but when it was his turn to sing the dog's sound it was not audible (R3C, P3B, I3A).

The teacher recorded the dog's sound on a switch and asked J to press the switch when it was his turn. In the first round, J did not respond in time and instead, someone pressed the hen's sounds when it was really J's turn. J vocalised when the teacher prompted him to press the switch, and he giggled. When the teacher gave him a second chance, he then pressed the switch (R4D, P4A, I4B). With some more practice, J was able to press the switch well in time to produce the 'bow-wow-wow' sound twice when taking turns with other children (R5B, P5A, I4D).

When the song got more complex and went up to six animals, J vocalised and waited for a while before pressing the switch (R4B, P4B, I4B). At this point, J seemed to be concentrating less and his performance level fluctuated. He would have a long pause when it was his turn to press the switch, even though the teacher had given clear instructions and several hints (R3A, P3A). He would keep quiet and then vocalised, or he vocalised instead of pressing the switch when it was his turn (R2A, P2C). In addition, he would press the switch when it was not his turn in the song, (R3A, P3A) or he pressed the switch when the teacher was working with another child on their animal parts (R2C, P2D, I2C).

After that, the teacher added different percussion to symbolise different animal sounds. A drum was symbolised to substitute the dog for J and he was fully prompted by a TA to play the drum when it was his turn (R3D, P1B)

In the group rhythmic chanting activity, J had the rhythmic chanting 'ta ti ti ta ti ti' (♩ ♫ ♩ ♫) recorded on his switch when working within his group. He showed better concentration while taking turns with another group on the rhythmic pattern 'ta ta ti ti ta' (♩ ♩ ♫ ♩). The music teacher showed the two groups different rhythmic cards for them to chant their own rhythmic patterns. J pressed the switch when it was his group's turn, showing good concentration throughout the activity which lasted for 27 seconds

(R4D, P4D, I4D).

When the music teacher played a CD for the children to listen to at the end of the music lesson, J seemed to be very sleepy and the teaching assistant suggested that J was perhaps too hot. After taking off his tops, J became more awake but it did not last for long because he became inactive when listening to the music. J appeared to be inactive when listening to the music (R1B). The following table summarises the coding in week 11 for J:

Table I.6 Week 11 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
11	J071		1	1			2	B	2	C
11	J072	1	1	1	5	A	5	A	5	A
11	J073		1	1			2	B	2	C
11	J074		1	1			3	D	2	D
11	J075	1	1	1	5	D	5	A	5	A
11	J076	1	1	1	3	C	3	B	3	A
11	J077		1				3	D		
11	J078		1				3	D		
11	J079		1				2	C		
11	J080	1	1	1	4	D	4	A	4	B
11	J081	1	1	1	5	A	5	A	4	D
11	J082	1	1	1	5	B	5	A	4	D
11	J083	1	1		3	A	3	A		
11	J084	1	1	1	4	B	4	B	4	B
11	J085	1	1	1	4	A	4	A	4	B
11	J086	1	1		3	A	3	A		
11	J087	1	1	1	2	D	2	C	2	D
11	J088	1	1	1	2	D	2	C	2	D
11	J089	1	1		2	A	2	C		
11	J090	1	1		3	D	1	B		
11	J091	1	1		3	D	1	B		
11	J092	1	1		3	A	1	B		
11	J093	1	1		3	A	3	D		
11	J094		1	1			3	D	3	C
11	J095	1	1	1	4	D	4	D	4	D
11	J096	1			1	B				

The following stack profile summarises the musical development mapping in week 11 for J. His musical behaviours ranged from level 1 to 5 in the reactive and proactive domains and level 2 to 5 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
11	R1	1	5	P1	3	12	I1		0
11	R2	3	16	P2	6	24	I2	5	33
11	R3	7	37	P3	8	32	I3	2	13
11	R4	4	21	P4	4	16	I4	6	40
11	R5	4	21	P5	4	16	I5	2	13
11	R6		0	P6		0	I6		0
11	Total	19	100	Total	25	100	Total	15	100

Figure I.6 Stack profile week 11 of J

Week 12

In week 12 (approximately the mid point of the reported observation period), the teacher was preparing the children to practise the animal song in readiness to present the song in the school assembly. J had a 'long' conversation with the teacher by answering 'yes' or 'no'. He understood the questions well and was clear about the answers that demonstrated how good he was in remembering last week's task (e.g. presented with a dog and producing a 'bow-wow-wow' sound) (see audio extract 1.1 in Appendix J) (R4A, P4A). He followed the teacher's instructions well when the teacher asked J to press the switch to see if the switch was working. J also pressed the switch appropriately when it was his turn (R4D, P4D, I4D, see extract 1.2 in Appendix J) when taking turns with another child in the animals' song.

Later, J pressed the switch, with good timing within the prominent musical structure even though the song was becoming more complex and longer (up to six animals in turn taking with other children) (R5B, P5A, I5A). When the teacher asked the children to choose an instrument to represent their animals, J chose a shaker to represent the dog in the song. For instrumental playing, J found it hard to play because of his physical difficulties, and needed the TA's help. When it was J's turn to play the shaker, he sometimes vocalised to show his awareness (R5A, P1B, I4D). The researcher felt that he recognised the turn taking and the structural features of the song, but his responses were constrained due to his physical disabilities and communication difficulties.

In a rhythmic notation work (see audio extract 1.3 in Appendix J), the teacher held J's hand to point out a rhythmic notation pattern on 'ti ti ta ta sh' (♫♩♩𝄽) and J participated in chanting 'ta' and 'sh' (R4A, P3A, I3C). For a small team work, J's group was chanting the rhythmic pattern on 'ta ta ti ti ta' (♩♩♫♩) while taking turns with another group for 'ti ti ti ti ta ta' (♫♫♩♩) . J chanted the first and last word 'ta' (♩) very clearly while reading the card simultaneously with the teacher and in taking turns with another group (R4B, P4B, I4B).

The teacher then changed to different rhythmic patterns for the two groups. J's group was chanting 'ti ti sh ti ti sh' (♫𝄽♫𝄽) and the other group was chanting 'ta ta ta ta' (♩♩♩♩). This time J seemed to be a little bit muddled and he said 'ta' in the place of 'sh', but he soon began to realise that the symbol should be 'sh'. J vocalised 'ta' when it was another team's turn and he also did 'sh' when it was his own team's turn. J engaged well and concentrated throughout the activity (R4D, P4D, I4D).

From time to time, J would put his right thumb in his mouth for comfort, when the teacher was talking or working with other children. In this music lesson, J exhibited a clear choice by saying, 'switch', 'no', 'yeah' and 'change'. When the teacher played the melody of the 'little bird' on the piano, J vocalised with excitement and in a loud voice. He attended during the whole piece of music and recognised the melody of the song (R5A, P4D, I5A). When the teacher started singing the song 'little bird' with piano accompaniment, J vocalised in-tune with the teacher's singing, enthusiastically and expressively, together with a wide opened mouth and bright eyes throughout the whole of the song (R5A, P5A, I5A).

When the teacher asked a child to sing the notes of the song 'little bird' with him, J laughed and also vocalised along with their singing (R4B, P4A, I4B). When the teacher asked J to sing the notes of the song, J said 'yeah' and also vocalised with the teacher (R4B, P3D, I4A). The teacher recorded the singing on the switch and asked J to do the switching. J vocalised actively throughout the singing on the switch, but he needed a partial prompt for pressing the switches (R5A, P5A, I5A). J showed great enthusiasm for reviewing the musical materials and tasks that he did several weeks' ago. The following table summarises the coding in week 12 of J:

Table I.7 The raw data table of J in week 12

		Domain Categorisation			Element Matching					
					R		P		I	
12	J097	1	1		4	A	3	D		
12	J098	1	1		4	A	4	A		
12	J099	1	1	1	4	D	4	D	4	D
12	J100	1	1	1	4	D	4	D	4	D
12	J101	1	1	1	5	B	5	A	5	A
12	J102	1	1	1	5	B	5	A	5	A
12	J103	1	1	1	5	B	5	A	5	A
12	J104		1				3	A		
12	J105	1	1		3	D	3	D		
12	J106	1	1	1	5	A	1	B	4	D
12	J107	1	1	1	3	D	2	C	2	B
12	J108	1	1	1	4	A	3	A	3	C
12	J109		1				3	D		
12	J110	1	1	1	4	B	4	B	4	B
12	J111	1	1	1	4	C	4	A	4	D
12	J112	1	1	1	4	D	4	D	4	D
12	J113	1	1	1	5	A	4	D	5	A
12	J114	1	1	1	5	A	5	A	5	A
12	J115	1	1	1	4	B	4	A	4	B
12	J116	1	1	1	4	B	3	D	4	A
12	J117		1				3	D		
12	J118	1	1	1	5	A	5	A	5	A

The following stack profile summarises J's musical development mapping in week 12. J's musical behaviours ranged from level 3 to 5 in the reactive domain, level 1 to 5 in the proactive and level 2 to 5 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and the interactive domain at level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
12	R1		0	P1	1	5	I1		0
12	R2		0	P2	1	5	I2	1	6
12	R3	2	11	P3	7	32	I3	1	6
12	R4	10	53	P4	8	36	I4	8	50
12	R5	7	37	P5	5	23	I5	6	38
12	R6		0	P6		0	I6		0
12	Total	19	100	Total	22	100	Total	16	100

Fig. I.7 Stack profile of J in week 12

Week 14

In week 14, the music teaching focused on exploring sounds on the Soundbeam. J demonstrated complete freedom by moving his hands in front of the Soundbeam doing solo work. The Soundbeam enabled him to have the physical capacity to produce a piece of music, growing in complexity and length (R5C, P5C). He seemed to understand how the sound worked and functioned with 'cause and effect' relationships of the Soundbeam. J performed with another child on different Soundbeams with the rock guitar by varying the material (sounds) given by the teacher (R5C, P5C, I4C).

J made music with his peers using the Soundbeam and he also did solos on the Soundbeam, on the jazz organ and, later on, on the rock guitar, to convey particular effects (R5C, P5C, I4C). It was in Soundbeam music making, J seemed to really enjoy the musical experiences. J screamed with excitement when he heard the bass rock guitar as a backing track for a few seconds. He improvised with another child, building on the structure material which was offered in simple ways by the music teacher (R4B). The music teacher set two Soundbeams at different corners in the hall and asked TAs to push the children's wheelchairs in front of these Soundbeams in turn. J made sounds by moving his hands in front of the Soundbeam, along with the backing track set by the teacher (R3A, P3C, I4C). The following table summarises the coding in week 14 for J:

Table I.8 Week 14 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
14	J119		1				3	D		
14	J120		1				3	D		
14	J121	1	1		5	C	5	C		
14	J122	1	1	1	5	C	5	C	4	C
14	J123	1	1	1	5	C	5	C	4	C
14	J124	1			4	B				
14	J125	1	1	1	3	A	3	C	4	C

The following stack profile summarises the musical development mapping in week 14 for J. His musical behaviours ranged from level 3 to 5 in the reactive and proactive domains and level 4 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 3 and 5 and the interactive domain at level 4 respectively.

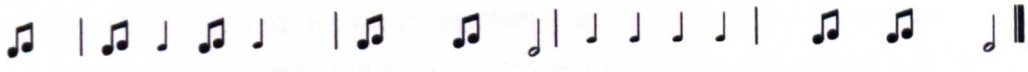
WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
14	R1		0	P1		0	I1		0
14	R2		0	P2		0	I2		0
14	R3	1	20	P3	3	50	I3		0
14	R4	1	20	P4		0	I4	3	100
14	R5	3	60	P5	3	50	I5		0
14	R6		0	P6		0	I6		0
14	Total	5	100	Total	6	100	Total	3	100

Figure I.8 Stack profile week 14 of J

Musical behaviours and development of J in phase two: weeks 15 to 21

Week 15

In week 15, the teaching objectives were to help the children to say the poem and put in some music to the lyrics. The music teacher recorded the poem on the switch.



'I'm a hop along, pop along, popcorn in the pan, in out, up down, catch me if you can'

J pressed the switch well in linking two phrases of the poem. He chanted in good timing by himself (R4B, P4B) and also along with two different children when they were reading the poem. This coherent response happened twice (R4C, P4C, I4C). In the same

activity, J also pressed the switch well at hearing the different quality of the voices, e.g. loud voice, squeaky mouse voice, whisper voice and monster voice that the teacher had recorded for him (R4C, P4B, I4C). J smiled and with open mouth vocalised when he had completed the task of pressing the switch, alone and in good timing.

In order to maintain the children's concentration and to test their familiarity with the poem, the teacher asked the children to say 'stop' or press the switch to say 'stop' when the teacher intentionally made mistakes in reading the poem. J would say 'stop' while imitating the teacher (R3D, P3D, I3A) or he pressed the switch to say 'stop' three times. It seemed that J may have recognised mistakes after the teacher's verbal cues (R3D, P3D).

In the group work, the teacher held J's hand to tap the beat while saying 'one, two, one two' (♩ ♩ ♩ ♩) and working with two of his peers. One child clapped her hands doing the same task as J and another child pressed the switch to activate the rhythmic chanting on 'hop along popcorn' (R3B, P1B, I2D). Later, they swapped roles and J was on the switch to 'say' the poem while working with the other children (R3C, P3C). In a similar activity, the music teacher helped J to tap a regular beat on his tray (♩ ♩ ♩ ♩) while another child said 'in out, up down' (♩ ♩ ♩ ♩) as an ostinato. J screamed with excitement and delight at the end of the activity (R3C, P1B).

After that, the music teacher then held one of J's hands to do the rhythmic patterns of 'hop along popcorn' and the other hand to beat the ostinato, before asking a child to distinguish the different tasks. So one of J's hands was doing 'in out up down' (♩ ♩ ♩ ♩) while the other was doing the rhythmic pattern  with help from the music teacher. J was much aware and smiled often when the teacher held his hands and tapped on his tray. J was exposed to the musical sounds that were systematically linked to other sensory input because the task had become very complicated (P1B, I2D). Later on, the teacher read the poem and helped J to play on the cowbell for the rhythmic pattern, while another child was playing on the drum – with a regular beat or the ostinato (P1B, I2D).

Extended further from the interactive group work, each child represented a different word for the ostinato pattern, and they chose different instruments to symbolise that word. J chose to be 'in' which was represented by a cowbell, one student U chose to be 'out' which was represented by a scraper, another student E chose to be 'up' which was represented by a drum and a teaching assistant was 'down' represented by a woodblock.

The teacher said the words 'in out up down' (♩ ♩ ♩ ♩) several times for them to practise and then read the poem while the children took turns to play their instruments in the correct order. J needed to be fully prompted to enable him to play the cowbell and participate in the activity (P1B, I2D).

The accompanied ostinato 'in out up down' (♩ ♩ ♩ ♩) was added to include another member to play the rhythmic patterns along with the teacher who was reading the poem. J was helped by a TA to play the cowbell and his playing was in time with the teacher. J screamed with delight after the activity had finished (R3D, P1B, I2D). The music teacher also played on the piano to create a sound screen accompaniment and read the poem while J and the other children did the same task again. J was helped by the TA to play the instrument so that he could participate in the activity (R3C, P1B, I2D).

In another activity, J and other children were given hand held chime bars – on pentatonic scale – (mainly on notes C and E) – to create a carpet of sound or musical background by ringing their chime bars, alongside whoever was reading the poem. J was helped by a TA to play on the chime bar on D (R3C, P1B, I2D). The following table summarises the coding in week 15 for J:

Table I.9 Week 15 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
15	J126	1	1	1	5	A	5	A	4	D
15	J127		1	1			2	B	2	B
15	J128	1	1		4	B	4	B		
15	J129	1	1	1	4	C	4	C	4	C
15	J130	1	1	1	3	D	3	D	3	A
15	J131	1	1		3	D	3	D		
15	J132	1	1		3	D	3	D		
15	J133	1	1	1	4	C	4	B	4	C
15	J134	1	1	1	4	C	4	B	4	C
15	J135	1	1	1	4	B	4	B	4	C
15	J136	1	1	1	4	C	4	B	4	C
15	J137	1	1	1	3	B	1	B	2	D
15	J138	1	1		3	C	3	C		
15	J139	1	1		3	C	1	B		
15	J140		1	1			1	B	2	D
15	J141		1	1			1	B	2	D
15	J142		1	1			1	B	2	D
15	J143	1	1	1	3	D	1	B	2	D
15	J144	1	1	1	3	C	1	B	2	D
15	J145	1	1	1	3	C	1	B	2	D

The following stack profile summarises the musical development mapping in week 15 for J. His musical behaviours ranged from level 3 to 5 in the reactive, level 1 to 5 in the proactive and level 2 to 4 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 1 and the interactive domain at level 2 respectively.

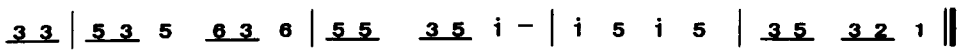
WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
15	R1		0	P1	8	40	I1		0
15	R2		0	P2	1	5	I2	8	53
15	R3	9	56	P3	4	20	I3	1	7
15	R4	6	38	P4	6	30	I4	6	40
15	R5	1	6	P5	1	5	I5		0
15	R6		0	P6		0	I6		0
15	Total	16	100	Total	20	100	Total	15	100

Figure I.9 Stack profile week 15 of J

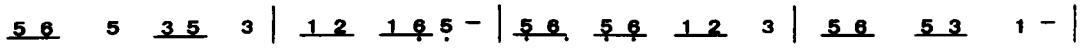
Week 16

In week 16, J was the first person to arrive in the music session and he made some sounds in front of a Soundbeam (R3C, P3C). A music technician came into the session and helped with the music technology for the project. When the music technician asked J's name, he was able to answer the question by himself (P3D, I2C). The music teacher spent most of the session discussing with the music technician potential ideas as to what they wanted to do in the project and tried out various possibilities using the music technology.

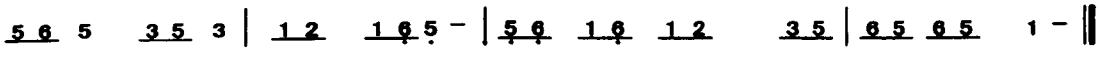
The two songs that they practised in the lesson were 'hop along popcorn' and 'sugar cake'. The lyrics and music for 'hop along popcorn' were:



'I'm a hop along, pop along, popcorn in the pen, in out, up down, catch me if you can'. The lyrics and music for 'sugar cake' were:



'sugar cake, sugar cake, bubbling in a pot, bobble bobble sugar cake, bubble thick and hot.



Sugar cake, sugar cake, spicy and coconut, sweet and sticky, brown and gooey, I could eat the lot'.

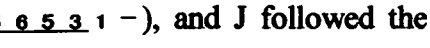
In turn taking activities, J needed to 'sing' the second line by pressing the switch three times to start and stop the musical phrase 'bobble bobble sugar cake, bubble thick and hot' (), and J followed the teacher's instructions well in time. He had reflexive vocalisation and screamed for joy when the teacher praised him and clapped him for his good work (R4B, P4A, I4B). Later on, J pressed the switch to link four musical phrases together which formed the whole piece of music, and he stopped pressing the switch at the right time after the last musical phrase (R5A, P5A). J seemed to be sensitive to sounds and touch. When the researcher worked with him as a teaching assistant, she found that by tapping the beat on J's arm and by giving him a verbal cue, he responded better and participated more effectively and accurately. The following table summarises the coding in week 16 for J:

Table I.10 Week 16 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
16	J146	1	1		3	C	3	C		
16	J147		1	1			3	D	2	C
16	J148	1	1	1	5	A	5	A	5	A
16	J149	1	1	1	4	B	4	A	4	B
16	J150	1	1		5	A	5	A		

The following stack profile summarises the musical development mapping in week 16 for J. His musical behaviours ranged from level 3 to 5 in the reactive and the proactive domains and level 2 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 3 and 5 and the interactive domain spread evenly at level 2, 4 and 5 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
16	R1		0	P1		0	I1		0
16	R2		0	P2		0	I2	1	33
16	R3	1	25	P3	2	40	I3		0
16	R4	1	25	P4	1	20	I4	1	33
16	R5	2	50	P5	2	40	I5	1	33
16	R6		0	P6		0	I6		0
16	Total	4	100	Total	5	100	Total	3	100

Figure I.10 Stack profile week 16 of J

Week 17

In week 17, J used his left hand to press the switch and linked four different phrases together for the song 'sugar cake'. However, he did not seem to recognise the ending of the song and so he kept pressing the switch. When he did finish the song the second time, the teacher took the switch away (R4B, P4B). When the teacher and children clapped him, he had a big smile and wide opened eyes and mouth.

When working with the music teacher on a 'one-to-one' basis, the teacher did the first and third phrases of the song 'sugar cake' by tapping on J's tray (♫♩♫♩| ♫♫𝅗𝅥) and J listened carefully and patiently for the teacher to finish his tapping. Then J pressed the switch in good timing to 'sing' the second and the fourth phrases on 'bobble bobble

sugar cake, bubble thick and hot' (5 6 5 6 1 2 3 | 5 6 5 3 1 –) and 'sweet and sticky, brown and gooey, I could eat the lot' (5 6 1 6 1 2 3 5 | 6 5 6 5 1 –). He kept good timing with the teacher for the whole song. J seemed to recognise the structural features of the song and knew that there were four lines in it (R5B, P5A, I4D).

During the second time of the same task, the teacher held J's right hand to tap on his tray the rhythmic patterns of the first and third musical phrases of the song, and he wanted J to press the switch on the second and fourth phrases. J did well on the second phrase, but he hesitated for a while before he pressed the last phrase. He seemed to need the teacher's physical reassurance (by touching his right arm) and a visual signal (by pointing to the switch) to complete the task (R5B, P5A, I4D).

When the teacher sang the song 'sugar cake' to the class, J sang the last word 'lot' spontaneously and simultaneously in good anticipation and pitch. He listened well and attended to the whole song, showing familiarity with certain phrases of the song (R5A, P5A, I5A). In the 'one-to-one' interaction context, the music teacher sang every phrase on 'sugar cake' and wanted J to sing back to him. J sang 'pot, hot, nut, (stic) ky, (goo) ey, lot' by imitating and responding to the teacher's singing. J sang the last word of nearly every phrase in turns with the teacher, showing some levels of synchronisation (R5A, P5A, I4D). The following table summarises the coding in week 17 for J:

Table I.11 Week 17 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
17	J151		1				3	D		
17	J152		1				3	D		
17	J153	1	1		4	B	4	B		
17	J154		1				3	D		
17	J155	1	1	1	5	B	5	A	4	D
17	J156	1	1	1	5	B	5	A	4	D
17	J157	1	1	1	5	A	5	A	5	A
17	J158	1	1	1	5	A	5	A	4	D

The following stack profile summarises the musical development mapping in week 17 for J. His musical behaviours ranged from level 4 to 5 in the reactive, level 3 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 5 and the interactive domain at level 4

respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
17	R1		0	P1		0	I1		0
17	R2		0	P2		0	I2		0
17	R3		0	P3	3	38	I3		0
17	R4	1	20	P4	1	13	I4	3	75
17	R5	4	80	P5	4	50	I5	1	25
17	R6		0	P6		0	I6		0
17	Total	5	100	Total	8	100	Total	4	100

Figure I.11 Stack profile week 17 of J

Week 18

In week 18, J volunteered to participate in the music activity. He pressed the switch in time to activate the next phrase of singing, followed by the teacher's verbal instruction, to link the four musical phrases together of the song 'sugar cake' (R5A, P5A). He used the switch well, without any help, and he opened his mouth and was really excited when everyone clapped him. In the listening and copying activity, J had taken turns with the teacher. He vocalised a few words after the music teacher had sung each phrase of the song 'sugar cake'. He could sing the last word of the song 'lot' clearly and simultaneously with the teacher in good timing (R5A, P5A, I4D).

During the second practice, the music technician recorded J's singing on the microphone. Even though these two rehearsals were rated as being the same, his singing seemed to improve during the second practice. He sang the third line 'cake', '(sti)cky', '(goo)ey' which he did not sing in the first practice. Here is the example:

T: sugar cake, sugar cake 5 6 5 3 5 3 |

J: Cake.

T: bobbling in a pot 1 2 1 6 5 – |

J: ha~, ha~la.

T: bobble, bobble, sugar cake 5 6 5 6 1 2 3 |

J: ha~, e~ cake.

T: bobble thick and hot 5 6 5 3 1 – |

J: hot. Ha~, e~ ha.

T: sugar cake, sugar cake 5 6 5 3 5 3 |

J: ha~.

T: spice and coconut 1 2 1 6 5 - |

J: ha~, na~.

T: sweet and sticky 5 6 1 6

J: ki~.

T: brown and gooey 1 2 3 5 |

J: e~, ha.

T: I could eat the lot 6 5 6 5 1 - ‖

J: ha~ lot (R5A, P5A, I4D).

J vocalised and tried to sing the last phrase 'I could eat the lot' but his singing was rather unclear. When the music technician played back J's singing on the computer, he closed and opened his eyes while listening to his own voice. It was difficult to tell if he recognised his own singing, but when the teacher clapped his work, he screamed with excitement (R4C).

J vocalised when a child was singing the song 'hop along popcorn' and the music teacher was playing on the piano. J sang the last word of the song 'can' clearly – with confidence and simultaneously with his peer – and then he laughed (R5A, P5A, I4C).

In the same song, J vocalised after each phrase that the teacher had sung. He was able to sing clearly the words 'pan', 'in', 'down' when taking his turn and he sang 'can' simultaneously with the teacher (R5B, P5A, I4D). The following was the example:

T: I'm a hop along 3 3 | 5 3 5

J: Ha~.

T: pop along 6 3 6 |

J: Ha~.

T: popcorn in the pan 5 5 3 5 i - |

J: Pan...ha~hee.

T: in out up down 1 5 1 5 |

J: in...ou (t)...down.

T: catch me if you can 3 5 3 2 1 ‖

J: Can!

In general, J sang expressively in his own time and version which did not exactly copy the teacher's singing. Due to communication difficulties, J could not pronounce the words in the song clearly. J sang alongside the teacher in singing 'sugar cake' and 'hop along popcorn'. He seemed to enjoy the one to one direct interaction and responded well with the teacher. He emphasised the last word of the song and was able to pronounce it more clearly – in time and in tune. The following table summarises the coding in week 18 for J:

Table I.12 Week 18 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
18	J159	1	1		5	A	5	A		
18	J160	1	1	1	5	A	5	A	4	D
18	J161	1	1	1	5	A	5	A	4	D
18	J162	1			4	C				
18	J163	1	1	1	5	A	5	A	4	C
18	J164	1	1	1	5	B	5	A	4	D

The following stack profile summarises the musical development mapping in week 18 for J. His musical behaviours ranged from level 4 to 5 in the reactive, level 5 in the proactive and level 4 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 5 and the interactive domain at level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
18	R1		0	P1		0	I1		0
18	R2		0	P2		0	I2		0
18	R3		0	P3		0	I3		0
18	R4	1	17	P4		0	I4	4	100
18	R5	5	83	P5	5	100	I5		0
18	R6		0	P6		0	I6		0
18	Total	6	100	Total	5	100	Total	4	100

Figure I.12 Stack profile week 18 of J

Week 19

In week 19, each child was assigned a musical phrase to present and they took turns in 'singing' the whole song 'sugar cake' by pressing different switch pads. J was assigned the musical phrase on 'sweet and sticky, brown and gooey' and he pressed the switch and followed the teacher's instructions well when taking turns twice with other children (R5A, P4C, I4D). Later on, the teacher needed to call out J's name to remind him that it was his turn, and he needed the staff's encouragement when it was his turn to press the switch (R4B, P4B). During the improvisation part of the song, J pressed the switch in his own timing, simultaneously with others, while sharing a common part of the pentatonic scale with his peers (R5B, P5B, I5A).

The musical structure for the song 'sugar cake' began from the cello and viola playing as an introduction, and had each child present a musical phrase and press their switch in the right order to sing the song in the first part. In the second part, the children improvised the music by pressing the switch in any order they liked. The last part of the arrangement was that, after their improvisation, each child pressed the switch by taking turns in the correct order to sing the song again. It was like an ABA form. J waited for a while before pressing the switch when it was his turn (R5B, P4D, I4C).

Later on in the first rehearsal, each child was assigned a teaching assistant to help them. J attended to the whole structure of the song by pressing the switch twice in the correct order and in good timing when taking turns with the other children. In the improvisation part, he pressed the switch freely and mixed the sounds together with the other children and the musicians. On the third part, they went back to press the switch in turn taking to sing each musical phrase again. J waited for a while when it was his turn to press the switch on 'sweet and sticky, brown and gooey' and needed the teacher's verbal reminder several times to press the switch before they finished the song (R5C, P5B, I5C). In the

second rehearsal, J followed the teacher's instruction and took turns with others in good timing and with accuracy (R5C, P5C, I5C). J seemed to listen carefully for the live music played by the cello and viola musicians. At a certain point during music lesson, J fell asleep while he was waiting for the other children to have their turn. The following table summarises the coding in week 19 for J:

Table I.13 Week 19 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
19	J165	1	1	1	5	B	5	A	5	A
19	J166	1	1	1	5	B	5	A	4	D
19	J167	1	1	1	5	A	5	A	4	D
19	J168	1	1	1	5	A	4	C	4	D
19	J169	1	1	1	5	A	4	C	4	D
19	J170	1		1	4	B			4	B
19	J171	1	1	1	5	B	5	B	5	A
19	J172	1	1	1	5	B	4	D	4	C
19	J173	1	1	1	5	B	5	A	4	C
19	J174	1	1	1	5	C	5	B	5	C
19	J175	1	1	1	5	C	5	C	5	C

The following stack profile summarises the musical development mapping in week 19 for J. His musical behaviours ranged from level 4 to 5 in the reactive, proactive and interactive domains. The modes for the reactive domain located at level 5, the proactive domain at level 5 and the interactive domain at level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
19	R1		0	P1		0	I1		0
19	R2		0	P2		0	I2		0
19	R3		0	P3		0	I3		0
19	R4	1	9	P4	3	30	I4	7	64
19	R5	10	91	P5	7	70	I5	4	36
19	R6		0	P6		0	I6		0
19	Total	11	100	Total	10	100	Total	11	100

Fig. I.13 Stack profile week 19 of J

Week 20

In week 20, the main activity was to rehearse with the musicians in group activity for the two songs that they were going to perform in 10 days' time. The music teacher recorded two parts of the song 'hop along popcorn' on red and blue switches and asked J to press the switch and link the phrases together. J followed the teacher's instruction well and then pressed the correct switches in the different colours (R5B, P4C). In the group singing activity, J sang simultaneously with the teacher and two other children, some of the words in the song 'hop along popcorn', for example, 'hop along', 'pan' and 'can'. J attended during the whole piece of the song. He sang roughly in time and some of his vocalisation was in tune (R5B, P5A, I5A).

In the switch work, J's switch was 'popcorn in the pan'. He waited a while before pressing the switch in his turn (R4D, P4D, I4D). In the second practice, J's switching became better and he switched well when taking turns with the others (R5A, P5A, I4D). Later on, the music teacher added some percussion instruments to accompany the children's playing. The scraper was playing for 'pop along' (♫♩) and wood stick was playing for 'popcorn' (♩♩). Everyone took turns to press the switch to sing each musical phrase along with the teacher's percussion and the musicians' accompaniment. When it was his turn, J pressed the switch in time following the teacher's instruction (R5A, P5A, I4D).

The music teacher then suggested that he was not going to point any longer but instead he would give a verbal cue when a child needed to play for the songs. J pressed the switch twice in time when it was his turn (R5B, P5A, I4D).

On the other song 'sugar cake', J waited for a while before pressing the switch, in turn with others, on 'bubble bubble sugar cake' while listening to live music accompanied by the orchestral musicians (R5A, P4B, I4D). J pressed the switch in improvising with the other children and then in turn taking to finish the song (R5C, P5B, I5C). In the second rehearsal on 'sugar cake', J pressed the switch in time when taking turns with the others, along with the musicians' accompaniment (R5C, P5A, I4D). Overall, J seemed to enjoy the live musical accompaniment to their songs. He had a good switching technique when the staff handed the switch closer to him and when he was prompted that it was his turn to play. The following table summarises the coding in week 20 for J:

Table I.14 Week 20 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
20	J176	1	1	1	5	A	5	A	5	A
20	J177	1	1		5	B	4	C		
20	J178		1				1	B		
20	J179	1	1	1	5	B	5	A	5	A
20	J180	1	1	1	4	D	4	D	4	D
20	J181	1	1	1	5	A	5	A	4	D
20	J182	1	1	1	5	A	5	A	4	D
20	J183	1	1	1	5	B	5	A	4	D
20	J184	1	1	1	5	A	4	B	4	D
20	J185	1	1	1	5	C	5	B	5	C
20	J186	1	1	1	5	C	5	A	4	D

The following stack profile summarises the musical development mapping in week 20 for J. His musical behaviours ranged from level 4 to 5 in the reactive, level 1 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 5 and the interactive domain at level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
20	R1		0	P1	1	9	I1		0
20	R2		0	P2		0	I2		0
20	R3		0	P3		0	I3		0
20	R4	1	10	P4	3	27	I4	6	67
20	R5	9	90	P5	7	64	I5	3	33
20	R6		0	P6		0	I6		0
20	Total	10	100	Total	11	100	Total	9	100

Figure I.14 Stack profile week 20 of J

Week 21

In week 21's music lesson, the orchestral musicians came in for a rehearsal of the two songs for the children's planned performance in three days' time. J opened his mouth and lifted up his hands when he listened to the live music playing. The teacher held J's hands and moved to the music to dance. J had big smiles on his face and appeared to be very happy (R4B).

The music teacher handed the children some shakers and small drums for them to play along with the live music. J vocalised shortly when the teacher held his hand to play a shaker and he enjoyed it very much, with a big open mouth (R4B, P1B). The teacher then gave J a big drum and helped him to beat on the drum according to the live music's tempo. J had expressive vocalisation towards the ensemble playing (R4B, P1B). J's left hand was relaxed down on the tray and his face lit up.

When the musicians started to play one of the songs and the researcher sang quietly to a child who sat next to J, J recognised the song immediately and turned to the researcher with his wide open mouth and big smile (R4B). In practice, the teacher asked J to sing the musical phrase 'bobble bobble sugar cake' and J vocalised in response (R4D, I4D).

In a rehearsal of the songs, J was presented with the musical phrase 'spice and coconut' and vocalised in time when it was his turn, and opened his mouth wide – with evident full enjoyment (R5B, P5A, I4D). J listened very well with good concentration throughout the whole song and vocalised the very last word 'lot' in good timing with the teacher's singing (R5A, P5A, I5A). When the teacher placed the switch in front of J, he pressed the switch in turn taking with other children (R5A, P5A, I4D). When the teacher moved away, J's eye followed the teacher's direction. Later, the music teacher went up to J and held his hands. J vocalised a short pattern of musical sounds in taking turns with others in the song 'sugar cake' (R5B, P5A, I4D). For detailed data analyses on the song 'sugar cake', see extracts 2.1 and 2.2 in section 8.4.

On the second song 'hop along popcorn', J started vocalising when he heard the teacher singing: 'in out, up down, catch me if you can'. J was very excited and vocalised with great enjoyment (R5C, P5A, I5A). He sang at the very last word 'can' clearly and in good timing. J's singing got more confident when the TA sang the music with him. He turned to the TA with a louder voice at the end of the song. He was smiling and listened well to the music (R5B, P5A, I5A). Later, J started to vocalise expressively, with another child and the teacher's singing, in good voice (R5A, P5B, I5B). (For a detailed example on the song 'hop along popcorn', see video extract 2.3 in section 8.4).

J participated in singing and vocalising the two songs along with the teacher's singing. His vocalisation was sometimes in time and in tune with the music. Because of his visual impairment, he might not always know who it was sitting next to him when it was his turn to press the switch in the group performance. The TA needed to whisper in his ear and adjust the switch on his left hand side so that J would be in a better position to press the switch. However, this did not always work and the TA would take the switch to touch J's hand if necessary.

While listening to live music played by the orchestra musicians, J put his left hand thumb into his mouth and then closed his eyes, seemingly in reflection to the mood of the music. When the music finished, J opened his eyes and looked in the musician's direction (R4D).

In an action activity, the teacher interacted with J using a poem chanting: 'Bananas, bananas, Clap! Clap! Clap! Bananas, bananas, Flap! Flap! Flap! Bananas, bananas, Click! Click! Click! Bananas, bananas, Flick! Flick! Flick! Bananas, bananas, Bump! Bump! Bump! Bananas, bananas, Jump! Jump! Jump!'. J was asked to press the switch to say 'bananas, bananas' while taking turns with the teacher and teaching assistants who needed to do the actions. J had a smile and pressed the switch in time on the first run (R5B, P5A, I4D).

When the music technician came into the hall, J seemed to be distracted and lost his concentration. He smiled, but did not press the switch although everyone was waiting for him. J opened his mouth and eyes when teacher called out his name to encourage him to concentrate and keep going. The TA then moved the switch closer to J and he then pressed the switch till the end of the poem (R4D, P4A, I4D). Staff clapped in appreciation for J and he had big smiles. Later, J laughed and found the poem and actions funny throughout the whole activity. He seemed to recognise the distinctive groups of chanting patterns, the structure of the activity, and the causal relationships between other people's action and the switch sound that he pressed (R4A). In a similar activity, J took turns with another child who was also on the switch to perform the poem (R4D, P4D, I4D).

In practising the song 'sugar cake', J waited for a long time before pressing the switch to sing his musical phrase 'sugar cake, sugar cake' when taking turns with others (R4B, P4A, I4C). In rehearsal, J pressed the switch better in time with turn taking, attending to the whole song (R5A, P5A, I4D). After the song 'sugar cake', the performance went straight into the song 'pop along popcorn'. J vocalised towards the music 'pop along' as soon as he heard the musicians play the first few notes of the melody (R4D, P4A, I4D). To finish the performance, the music went back to 'sugar cake' again. J pressed the switch to sing the musical phrase when it was his turn (R5A, P5A, I4D).

In the last rehearsal, J pressed the switch on the song 'sugar cake' – with a delayed response when given the time in turn taking (R5A, P4B, I4D). The improvisation part went very well (R5C, P5B, I5C) but J was much delayed in his response to press the switch when it was his turn to go back to switch the song in turn taking (R4B, P4A,

I4D). Then the music went straight into 'pop along popcorn' and J's musical phrase was 'up, down'. He pressed the switch in time with the others (R5A, P5A, I4D). The last part of the performance went back to the song 'sugar cake' and this time J performed well in the task (R5C, P5A, I4D). The following table summarises the coding in week 21 of J:

Table I.15 The raw data table of J in week 21

		Domain Categorisation			Element Matching					
					R		P		I	
21	J187	1			4	B				
21	J188	1	1		4	B	1	B		
21	J189	1	1		4	B	1	B		
21	J190	1	1		4	B	1	B		
21	J191	1			4	B				
21	J192	1		1	4	D			4	D
21	J193	1	1	1	5	B	5	A	4	D
21	J194	1	1	1	5	A	5	A	5	A
21	J195	1	1	1	5	A	5	A	4	D
21	J196	1	1	1	5	B	5	A	4	D
21	J197	1	1	1	5	C	5	A	5	A
21	J198	1	1	1	5	B	5	A	5	A
21	J199	1	1	1	5	A	5	B	5	B
21	J200	1			4	D				
21	J201	1	1	1	5	B	5	A	4	D
21	J202	1	1	1	4	D	4	A	4	D
21	J203	1			4	A				
21	J204	1	1	1	4	D	4	D	4	D
21	J205	1	1	1	4	B	4	A	4	C
21	J206	1	1	1	5	A	5	A	4	D
21	J207	1	1	1	4	D	4	A	4	D
21	J208	1	1	1	5	A	5	A	4	D
21	J209	1	1	1	5	A	4	B	4	D
21	J210	1	1	1	5	C	5	B	5	C
21	J211	1	1	1	4	B	4	A	4	D
21	J212	1	1	1	5	A	5	A	4	D
21	J213	1	1	1	5	C	5	A	4	D

The following stack profile summarises J's musical development mapping in week 21. His musical behaviours ranged from level 4 to 5 in the reactive domain, levels 1 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 5 and the interactive domain at level 4 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
21	R1		0	P1	3	14	I1		0
21	R2		0	P2		0	I2		0
21	R3		0	P3		0	I3		0
21	R4	13	48	P4	6	27	I4	15	75
21	R5	14	52	P5	13	59	I5	5	25
21	R6		0	P6		0	I6		0
21	Total	27	100	Total	22	100	Total	20	100

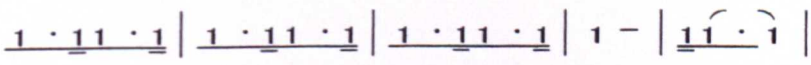
Fig. I.15 Stack profile of J in week 21

Musical behaviours and development of J post project: week 22

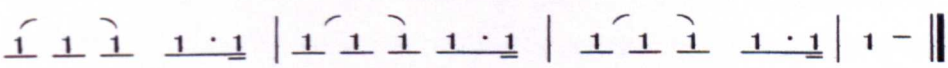
The special music project 'Music Makers Sing!' finished in week 21. Week 22 was also the last observational week for case J.

Week 22

In week 22, the music teacher introduced to the class a new poem and the teacher read the poem in a dramatic voice. The poem was: '(In flexible tempo) one misty moisty morning, when cloudy was the weather, I met a primary teacher, clothed all in leather' (which is the first part of the poem).



She began to compliment and I began to sing, saying, (second part of the poem)



how do you do, and how do you do, and how do you do again (third part of the poem).

When the teacher shook each child's hand in turn while saying 'how do you do, and how do you do, and how do you do again', J showed his excitement and opened his mouth wide. He vocalised at the teacher's chanting and hand shaking (R3D, P3C). The teacher then recorded the poem on switch and asked J to do the switching for reading

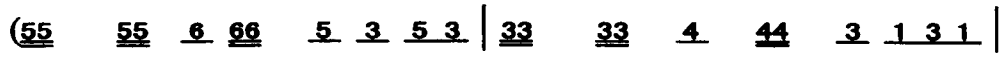
the poem and having a 'conversation' with J. J pressed the switch all by himself – in turn with the teacher – and had a big smile at the end, when shaking hands with him (R4D, P4C, I4D). Here is an example:

J pressed the switch: 'one misty moisty morning'
T: well done, J. This is very scary.
J pressed the switch: 'when cloudy was the weather'
T: Oh, my goodness. Who did you met, J?
J pressed the switch: 'I met an upper primary teacher'
T: what was she wearing, J?
J pressed the switch: 'clothed all in leather'
T: Oh, my goodness. What happened next?
J pressed the switch: 'She began to compliment and I began to sing'
T: really? What happened after that, J?
J pressed the switch: 'saying'
T: What did she say, J?
J pressed the switch: 'how do you do, and how do you do, and how do you do again'
T: well done, J.

The teacher demonstrated the whole structure of the poem and sound effects again to introduce the next activity. The first part of the poem 'one misty moisty morning, when cloudy was the weather, I met a primary teacher, clothed all in leather' was produced by the teacher in 'spooky' sounds with a flexible tempo. Drumming was added to the second part with a regular beat. The third part provided the chance for students to have hand shaking with each other. In the demonstration, J smiled when the teacher took his hand to tap on the tray in the second part, and shook his hands in the third part (R3C, P1B).

Later on, the teacher expanded the poem into three part group activities. The first part was that the children were moved around in the hall, in and out of the two set up Soundbeams, with the help of the TAs to create spooky sounds and atmosphere. In the second part, everyone needed to freeze when they heard the word 'leather' and listened to the drumming played by the teacher on the second part. When they heard the drumming, they could move again. In the third part, they needed to find their own partner and shake hands with each other. J had wide opened eyes while being pushed in front of the Soundbeams, and he had a big smile when one of his peers shook hands with him during the third part of the activity (R5A, I2D).

Later, the teacher introduced to the class a new song and sang



'Kookaburra sits in the old gum tree, Merry, merry king of the bush is he,

Laugh, Kookaburra, laugh, Kookaburra, Gay your life must be

J seemed to listen to the whole song attentively and with concentration. When asked to sing the song with the teacher, J said, 'yeah' in a loud voice. J pressed the switch to 'sing' the song by himself while the music teacher sang the second part to form a rondo form. J sang the last word 'be' at the end clearly and sang it simultaneously with the teacher after attending to the whole song, and he then gave a big smile (R5A, P5A, I5A). His eyes opened wide and alert when he heard other people clap him after he had pressed his switch. The following table summarises the coding in week 22 for J:

Table I.16 Week 22 raw data table for J

		Domain Categorisation			Element Matching					
					R		P		I	
22	J214	1			3	C				
22	J215	1	1		3	D	3	C		
22	J216	1	1	1	4	D	4	C	4	D
22	J217	1	1		3	C	1	B		
22	J218	1		1	5	A			2	D
22	J219	1	1	1	5	A	5	A	5	A

The following stack profile summarises the musical development mapping in week 22 for J. His musical behaviours ranged from level 3 to 5 in the reactive, level 1 to 5 in the proactive and level 2 to 5 in the interactive domains. The modes for the reactive domain located at level 3, the proactive domain was evenly spread out at level 1, 3, 4 and 5 and the interactive domain at level 2, 4 and 5 respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
22	R1		0	P1	1	25	I1		0
22	R2		0	P2		0	I2	1	33
22	R3	3	50	P3	1	25	I3		0
22	R4	1	17	P4	1	25	I4	1	33
22	R5	2	33	P5	1	25	I5	1	33
22	R6		0	P6		0	I6		0
22	Total	6	100	Total	4	100	Total	3	100

Figure I.16 Stack profile week 22 of J

Appendix J

Audio data analyses of J

The following detailed extracts of audio data and their analyses for J were taken from week 12. In extract 1.1, the teacher asked the children what they did in the previous week and the specific roles that J and other children had played. In extract 1.2, the children practised the animal song in turn taking by singing or using the switches. J represented the dog and he needed to press the switch or sing his musical phrase to make the sound when it was his turn, within the musical structure and in the right order. In extract 1.3, the class was divided into two groups to read rhythmic cards. The teacher gave marks afterwards on the children's performances in reading the cards.

Table J.1 Detailed audio transcription extracts in week 12 (phase one) of J

Sol rating	Evidence (extract 1.1, week 12)	Comment
J: R4A, P3D	T: 'we are going to practise this song, because we are going to do it in assembly. Do you remember the song we did last week? It goes like this. K, do you remember you helped me? What did the cat do in my song? The cat went (2 2#4)...	J had a clear 'long' conversation with the teacher answering yes or no in remembering last week's musical activity. He understood the questions and was clear about the answers (R4A, P3D). It showed that J remembered well what he did last week.
	K: fiddle-i-dee (6 6#4 2 – – –).	
	T: 'good boy. The cat went fiddle-i-dee (2 | 2#4 6 6#4 | 2 – – – |). Do you remember that, J?	
	J: 'yeah'.	
	T: 'J, which part did you do last week? Were you a chicken?'	
	J: 'No'.	
	T: Were you a hen? Were you a cow?	
	J: 'No'.	When the teacher asked J to press the switch to see if the switch was working, J pressed the switch and followed the instructions from the teacher (R4A, P4A).
	T: 'Were you a dog?'	
	J: 'Yeah'.	
	T: 'you were. I remember now. So what did the dog say?	
	J: 'Dee'.	
J: R4A, P4A	T: 'Did the dog say "bow-wow-wow" (6 6 6)?	
	J: 'Yeah'.	

	T: 'Yeah. Good boy, ok, well done, J. (Teacher then recorded the singing bow-wow-wow on the switch and tested it). Good, can you test this one for me, J? Try and see if it works. Well done. I'm going to leave that for you'.	
Sol rating	Evidence (extract 1.2, week 12)	Comment
J: R4D, P4D, I4D	T: 'are you ready, K? Brought me a cat and the cat pleased me, (2 2 2 #4 #4 #4 | 2 3 #4 – | bed my cat in yonder tree, the cat went... 2 3 #4 6 | 6 #4 2 · 2 | 2 #4 K: 'fiddle-i-dee (6 6 #4 | 2 – – –)'. T: 'good boy. Brought me a dog and the dog pleased me, (2 2 2 #4 #4 #4 | 2 3 #4 – | 'bed my dog in yonder tree, the dog went 2 3 #4 6 | 6 #4 2 · 2 | 2 3 K: 'Bow-wow-wow' (#4 #4 #4). T: 'Sh, J's turn'. J presses the switch: Bow-wow-wow (5 5 5) T: and the cat went (2 2 2 #4) K: fiddle-i-dee (6 6 #4 | 3 – – – |) T: fiddle-i-dee (6 6 #4 | 2 – – – |). Well done. That's fantastic. J presses the switch again and the switch sounds:	J pressed the switch to produce the dog sound in singing (R4D, P4D, I4D). Note: J pressed the dog sound again after the song had finished. His intention was not very clear but he might have accidentally pressed the switch, or lost his concentration.

	bow-wow-wow (5 5 5).	
Sol rating	Evidence (extract 1.3, week 12)	Comment
J: R4A, P3A, I3C	T: 'Ok, let's get J to do this one. J, this one is really hard. But you are so good at music, you will be able to do it very nicely with me. Are you ready? Do you see that one, J? Should we point to it together? Ti ti, ta, ta, sh (♫♩♩𝄽) . Ti ti, ta, ta, sh (♫♩♩𝄽). J: sh. T: 'Thank you, J, that is really good. Ti ti, ta, ta, sh (♫♩♩𝄽)'. J: ta (J said 'ta' on the second time). He then vocalised with excitement when everyone clapped him: A~ (35 3 3). T: 'Wow, J, what a star! I'll put you on the happy side for that beautiful reading. I love your 'sh'. Fantastic! Isn't that good work. Now we are so good at reading those cards. We'll have a game and we need two teams to play. So in the first team, I think we will have K and Z and in the other team I think we will have J and U. Now, I am going to get Z to choose the card for her team. Ok? And I am going to get U to do the same for his team...Z has chosen for her team ti ti, ti ti, ta, ta (♫♫♩♩). Let's get K to read that card. K, ti ti, ti ti, ta, ta (♫♫♩♩). Can you read it for me? Ti ti, ti ti, ta, ta (♫♫♩♩) . (K mouthed the rhythm 'ta ta' very quietly) T: 'Very good. Here is the lovely card for U and J's team, ta, ta, ti ti, ta (♩♩♫♩). K: ti ti. T: 'can you read it for me, J? Ta, Ta, ti ti, ta (♩♩♫♩). J: ta ta...ta!	When J was helped to point the rhythmic cards by the teacher on 'ti ti ta ta sh', J said 'sh' clearly on the second occasion (R4A, P3A, I3C). J vocalised with excitement at the teacher's comment and his peers ovation which showed his ability for understanding the appraisal. J said the first and last 'ta' clearly, reading the card

J: R4B, P4B, I4B	T: Very good reading. Ok, I am going to steal that card from you. Now, so when I hold out this card, I want this team to read it. That's team Z and team K, ok? But if I hold up this card, it's team J and team U's turn. Are you ready team? (teacher stamps his feet to give the steady tempo ♩♩♩♩ and started chanting) Are you really ready team? ♫♫♫♪? I don't know which one is (♫♫♫) going to be the first one (♫♪♫♫), so you have to stay awake (♫♫♫♩). Are you ready then (♫♫♪) off we go now (♫♫), J vocalises a few seconds. T: ta, ta, ti ti, ta (♩♩♫♩). J: ta.(he says it at the last rhythmic word – with a bit delayed response) T: Ti ti, ti ti, ta, ta (♫♫♩♩). Z: ta ta. T: ta, ta, ti ti, ta (♩♩♫♩). K: ta. T: Ti ti, ti ti, ta, ta (♫♫♩♩). Well, I tell you what, I am going to give the marks to the teams now. For this team, no points because you are too sleepy. And for this team, no points, because you are also too sleepy. You are gonna wake up now'. TA: K, wake up. T: Z should you be looking at the other team or should you be looking at the card? Z: Card. T: At the card, good girl. Ready K, wake up K for your part. Are you ready then (♫♫♪) off you go now (♫♫),	simultaneously with the teacher (R4B, P4B, I4B).

J: R4C, P4A, I4D	T: Ti ti, ti ti, ta, ta (♫♫♩♩). K: ta ta. T: ta, ta, ti ti, ta (♩♩♫♩). TA: ta, come on (talking to J). J: Ta. (He says confidentally and simultaneously with the teacher the last rhythmic word). T: Ti ti ti ti ta, ta (♫♫♩♩). K: ta, ta (♩♩) T: ta, ta, ti ti, ta (♩♩♫♩). J: Ta, Ta...Ta. (♩♩ ♩) (he says simultaneously with the teacher). T: Ti ti ti ti ta, ta (♫♫♩♩). Z: Ti ti ti ti ta, ta (♫♫♩♩). TA: K, shout it. T: ta, ta, ti ti, ta (♩♩♫♩). J: Ta! (He says simultaneously with the teacher in a loud voice at the last rhythmic word). T: Ti ti ti ti ta, ta (♫♫♩♩). Z: ta, ta (♩♩). T: ta, ta, ti ti... (♩♩♫). (teacher does not say the last word, and waits for J to say it) J: Ta! (♩) (he says the last rhythmic word by himself in time with the tempo rhythm). T: 'Wow that was pretty fantastic work'. J vocalised with excitement. T: 'So for J's team, I think 10 points'. TA: Yahoo. 10 points, Yeah!	J said 'ta' at the end of each rhythmic chanting clearly when he was taking turns with another team. J vocalised excitingly and laughed (R4C, P4A, I4D).

	T: And for this team, 7 points. So now, what would happen if I changed the cards and made it a bit trickier. T: Are you ready to read your new card? Off you go now. ta, ta, ta, ta (♩♩♩♩). K: ta ta ta ta (♩♩♩♩) (he reads the card simultaneously with the teacher). T: Ti ti sh, ti ti sh (♫ 𝄿 ♫ 𝄿). J: sh...sh. T: ta, ta, ta, ta (♩♩♩♩) K: ta ta ta ta (♩♩♩♩) (he reads the card simultaneously with the teacher) J: Ta. T: Ti ti sh, ti ti sh (♫ 𝄿 ♫ 𝄿). TA: ready? (talking to J) J: Ta...sh. TA: good boy. T: ta, ta, ta, ta (♩♩♩♩) J: Ta----( )	
	T: Ti ti sh, ti ti sh (♫ 𝄿 ♫ 𝄿). TA: ready? (talking to J) J: ta...sh. (then J maybe realises that 𝄿 should be pronounced as 'sh') T: good boy. T: ta, ta, ta, ta (♩♩♩♩) Z: ta.	J said 'ta' in the place of 'sh' and he may have understood that he should pronounce 'sh' soon afterwards. J vocalised as saying 'ta' when it was another team's turn. And he also did 'sh' when it was his turn, signaled by the TA. J engaged well and concentrated
J: R4D, P4D, I4D	T: Ti ti sh, ti ti sh (♫ 𝄿 ♫ 𝄿). TA: come on. (talking to J) J: sh. T: 'Well, That time, I can tell you that J got 15 points for	

	good work'. TA: Yeah!	throughout the activity (R4D, P4D, I4D).

The features in these extracts which demonstrated J's rating in the reactive, proactive and interactive domains are mainly at level 4. J demonstrated that he recognised the structure of the animal song well, and presented his part on time towards the teacher's singing. J showed musical engagement in the group competition activities by reading rhythmic cards. J was able to say the first and last word of a rhythmic phrase when the teacher showed him the flash cards. However, it was not clear as to what extent J recognised and understood the relationship between the rhythmic symbols and the rhythmic chanting. One thing which seemed to be more certain was that the children mainly learnt musical phrases, or a whole piece of music, through listening and imitating the teacher accompanied by a great deal of repetition.

Appendix K

Weekly coding, comments and analyses for the musical behaviours and development of K

Musical behaviours and development of K in term one (the school spring term): weeks 1 to 13

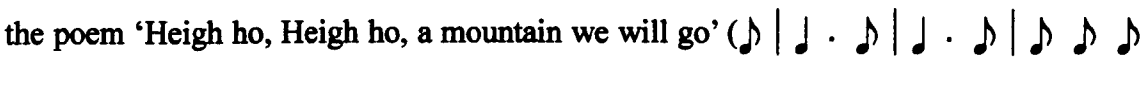
Week 2

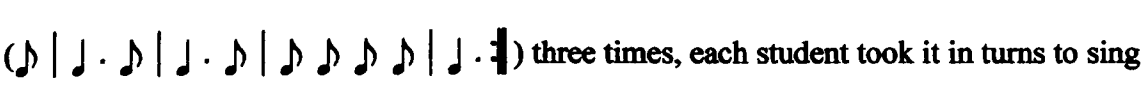
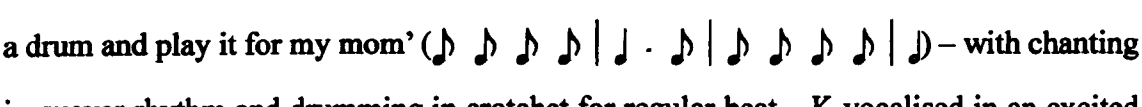
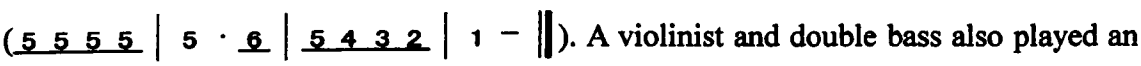
Week 2 was near the end of the school Christmas break in December 2006. The teacher sang the 'hello song' in greeting to each student in the class. When the teacher sang 'hello K' (4 3 | 1 1 · – –), K waited for a few seconds before she pressed the switch to sing 'hello' (3 | 1 – – –) back to the teacher, at the very last phrase of the 'hello song' (R4A, P4A, I4A). In peer greeting when singing the same 'hello song', one student pressed the switch to sing 'hello K' (1 2 | 4 – – –) and shook hands with K. The teacher congratulated them and reminded the student to wait until K had pressed her switch to say 'hello' back to him. K then waited for about 45 seconds before she pressed the switch to return the 'hello' (6 | 4 – – –) (R3A, P3A, I2C).

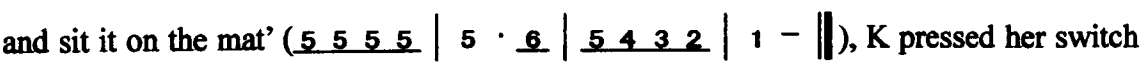
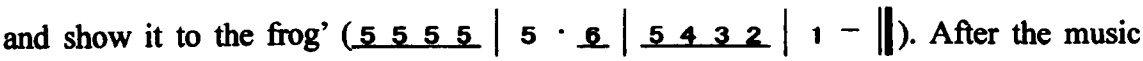
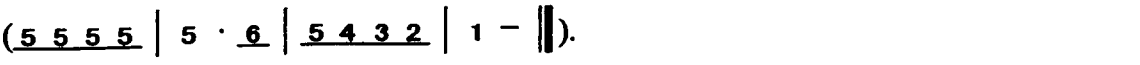
After the 'hello song' with the peer greeting, the teacher commented that he had heard K using her 'singing voice' during the activity, and that it was fantastic (R4A, P4A, I2A). When the teacher commented 'it's funny but everybody has got a good singing voice', K pressed the switch to sing 'hello' (6 | 4 – – –) again while the teacher was still talking (R3A, P3A, I2C).

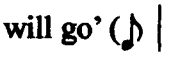
Two professional musicians from a famous orchestra visited the music class today. One played the double bass and the other played the violin. The music teacher gave outline instructions for the musicians to play background music while the students participated in musical activities. The double bass started to pluck the G string to produce a steady jazz beat. Then the teacher asked K to press the switch three times – which was pre-recorded by the teacher – to whisper 'Heigh ho, Heigh ho, a mountain we will go' (♪ | ♩ · ♪ | ♩ · ♪ | ♪ ♪ ♪ ♪ | ♩ · 𝄽) in rhythmic pattern chanting. K's switching was on good time during the second time, but was a bit delayed during the first and

third times (R3B, P3A).

This activity was developed further when K and another student were asked to press their switches at the same time, to produce the rhythmic chanting, during the first part of the poem 'Heigh ho, Heigh ho, a mountain we will go' (). The double bass played alongside with their 'switching' to provide a regular beat and the background music. However, K and the other student pressed the switch at slightly different times. K's switching was a little behind (R3C, P3B, I3C) and the two were not exactly synchronising.

After the introduction of the chanting of 'Heigh ho, Heigh ho, a mountain we will go' () three times, each student took it in turns to sing a rhymed phrase. The teacher played on the drum and assigned K the word 'drum' for her phrase and K responded. When the teacher made up a phrase for K on 'we will find a drum and play it for my mom' () – with chanting in quaver rhythm and drumming in crotchet for regular beat – K vocalised in an excited manner (R4B, P3D, I2C). Her vocalisation rose to a high pitch while the teacher recorded his singing on the switch 'we will find a drum, and play it for my mom' (). A violinist and double bass also played an accompaniment part as background music for keeping the beat. K laughed and vocalised while the teacher was getting other children's choices on words to rhyme (R4A, P2C).

When the teacher assigned different phrases to different students, e.g. 'we will buy a bat and sit it on the mat' (), K pressed her switch twice to sing her part and linked the two phrases together. K then repeated practising on her switch (R4A, P3A) while the teacher recorded another phrase 'we will find a dog, and show it to the frog' (). After the music teacher had commented on this situation and given positive feedback to K, other students also joined in by pressing their switches and laughing while the teacher recorded another student's phrase 'we will find a mouse and chase it in the house' ().

In explaining the structure of the song, the teacher said that the first part of the song was 'Heigh ho, Heigh ho, a mountain we will go' () in chanting for four times. The second part was singing 'we will find, we will find, we will find, we will find' (). The third part was for each student to take turns in singing their phrase in rhyme. The whole song was accompanied by two musicians' instrumental playing on double bass and violin giving an uplifting rhythm and beat. K was the first person in the third part to sing her phrase. She pressed her switch twice and linked two phrases together in time to sing 'we will find a drum', 'and play it for my mom' () (R4D, P4D, I4D).

During the second practice, the teacher wanted the students to do it in order and explained the different parts again and chose which student should go first, second and the third. The students rehearsed from the beginning. When the teacher called out K's name when it was her turn, K waited for 30 seconds before pressing the switch to sing her phrase. However, she seemed to link the two phrases well (R4D, P4B, I4D).

The teacher discussed in the class about the ending for the song and he offered two choices from which the students could choose. For the ending of the song, the teacher demonstrated that it finished by returning to either whispering 'Heigh ho, Heigh ho, a mountain we will go' () and getting quieter or getting louder. The teacher recorded the answer 'that's the one' on K's switch and asked for her opinion on the endings. Should it be louder, quieter, or in the middle? K waited for 27 seconds then pressed the switch to make her choice, after the teacher had said 'in the middle'. However, later when the teacher said 'I think I would have also voted for that one (louder)' then K pressed the switch again (R2B, P2D, I2C).

Humour was used in the classroom when the teacher recorded K's part in singing in a female high pitched voice. This made K laugh as she found it funny (R2B, P2B). In addition, the teacher added a clapping part with two quavers and a crochet into K's phrases. With the violin's help in playing along with the clapping part, K pressed the switch twice to link two motifs together while the musicians were playing the accompaniment. She also followed the instruction well when the teacher asked her to do it again. Her timing was good (R4B, P4B, I4D). On the third practice, the teacher

whispered K's name and K hesitated about 14 seconds before pressing the switch when it was her turn to sing her phrase (R4B, P4A, I4D).

Near the end of the lesson, the teacher reviewed a West African children's song called 'Che che kule' which the students had learned five weeks ago. It was a call and response song where the teacher sang each musical phrase and the students copied. The song went like this: Che che kule (5 5 4 5), Che che kofisa (5 5 4 6 5), Kofisa langa (4 6 4 5 5), Langa chi langa (4 4 6 5 5), com a dande (i · 6 5 6). One student was chosen as leader and K pressed her switch to play the response part which was pre-recorded by one of the TAs on each musical phrase. K pressed the switch well on time (R4B, P4B, I4A). Table K.1 summarises the coding in week 2 of K.

Table K.1 The raw data table of K in week 2

		Domain Categorisation			Element Matching					
					R		P		I	
WK	OBS	R	P	I	Score	Element	Score	Element	Score	Element
2	K001	1	1	1	4	A	4	A	4	A
2	K002	1	1	1	3	A	3	A	2	C
2	K003	1	1	1	4	A	4	A	2	A
2	K004	1	1	1	3	A	3	A	2	C
2	K005	1	1		3	B	3	A		
2	K006	1	1	1	3	C	3	B	3	C
2	K007	1	1	1	4	B	3	D	2	C
2	K008	1	1		4	A	2	C		
2	K009	1	1		4	A	3	A		
2	K010	1	1	1	4	D	4	D	4	D
2	K011	1	1	1	4	D	4	B	4	D
2	K012	1	1	1	2	B	2	D	2	C
2	K013	1	1		2	B	2	B		
2	K014	1	1	1	4	B	4	B	4	D
2	K015	1	1	1	4	B	4	A	4	D
2	K016	1	1	1	4	B	4	B	4	A

Fig. K.1 summarises the musical development mapping in week 2 of K, through a weekly stack profile. Her musical behaviours ranged from level 2 to 4 in the reactive, proactive and interactive domains. The modes for the three domains were all at level 4 (demonstrated by the darker shading for these codings).

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
2	R1	0	0	P1	0	0	I1	0	0
	R2	2	13	P2	3	19	I2	5	42
	R3	4	25	P3	6	38	I3	1	8
	R4	10	63	P4	7	44	I4	6	50
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	16	100	Total	16	100	Total	12	100

Fig. K.1 Stack profile of K in week 2

Week 3

After the Christmas break, the students came back to the school in week 3. This was the beginning of the school's spring term in January 2007. The teacher introduced a new song called 'bells in the steeple' for the students to learn. The teacher recorded the song in two phrases: 'bells in the steeple how sweetly they ring' (1 1 1 | 3 3 3 | 5 5 5 | 3 – –), and 'this is the holiday, ding ding dong ding' (1 3 5 | 1 3 5 | 1 3 5 | 1 – – ‖). K was asked to press the switch to activate the singing of the song. She waited for about 20 seconds before doing this for the first phrase and then after 5 seconds she pressed the switch again to link the second phrase (R4B, P4B). The teacher praised K for her switching and asked her to do it again. On the second time, K waited for about 20 seconds before she pressed the switch to sing the song and she linked two phrases together well (R4B, P4B).

The teacher asked K how many lines there were in the song and offered her two choices – two lines or five lines. K waited for 4 seconds and pressed the switch to say 'that's the one' when the teacher offered the choice of two lines (R4C, P3D, I4B). The teacher then praised her for giving the correct answer. When the teacher demonstrated and sang the first line, K pressed the switch to say 'that's the one'. It was unclear if K knew it was the first phrase or whether she had just accidentally touched the switch (R3C, P2C, I2C).

In making the connection between the high, middle and low notes, the teacher held K's hand to move it up and down in the air, and sang three different notes in the song, twice. The teacher sang these notes as: low low low, middle middle middle, high high high, middle (1 1 1 | 3 3 3 | 5 5 5 | 3 – –); low middle high, low middle high, low

middle high, low (1 3 5 | 1 3 5 | 1 3 5 | 1 – –). These hand movements were to help K to associate the notes. She was wheeled in front of the class to do the task, and after she had finished the class clapped her for her work (R1D, I1D).

To further develop this activity, the teacher assigned K and another two students as 'do', 'mi' and 'so' notes. After the teacher recorded 'do' on K's switch, she started to press her note 'do' several times by herself while the teacher was recording different notes for other students (R3A, P3A). There were then different switch sounds all happening at the same time. When she took turns with another two students to sing the song 'bells in the steeple', K pressed the switch three times to produce the note 'do' after a short delay – following the teacher's reminder and instruction. For example, K waited 20 seconds before she pressed the switch for her turn during the second musical phrase on 'do mi so'. In general, K performed well, roughly in time when it was her turn to sing the song (R4B, P4B, I4D).

On the second practice, K pressed the switch well in time on the first three notes. On the second phrase, K waited for three to eight seconds before pressing the switch for her turn and this was faster compared to the first practice. In general, she speeded up her responses and pressed the switch quicker and sometimes was in time when she took turns with two other people (R5A, P5A, I4D). The teacher congratulated K on how well she had done with her switching.

Later, the teacher introduced the concept of 'canon' by asking a student to switch the song, and he followed along a few notes later, which formed a harmony with the tune, twice. After demonstrating singing in a canon, the teacher asked K if she had noticed. K seemed to use eye pointing to indicate her answer but it was not clear from the interaction between K and the teacher what was meant (R1C, P2B, I1B). Then the teacher joked about K's switch going 'fishing' and K laughed. Table K.2 summarises the coding in week 3 for K:

Table K.2 The raw data table for K in week 3

		Domain Categorisation			Element Matching					
					R		P		I	
WK	OBS	R	P	I	Score	Element	Score	Element	Score	Element
3	K017	1	1		4	B	4	B		
3	K018	1	1		4	B	4	B		
3	K019	1	1	1	4	C	3	D	4	B
3	K020	1	1	1	3	C	2	C	2	C
3	K021	1		1	1	D			1	D
3	K022	1	1		3	A	3	A		
3	K023	1	1	1	4	B	4	B	4	D
3	K024	1	1	1	5	A	5	A	4	D
3	K025	1	1	1	1	C	2	B	1	B

The following stack profile (Fig. K.2) summarises the musical development mapping in week 3 for K. Her musical behaviours ranged from level 1 to 5 in the reactive domain, level 2 to 5 in the proactive and level 1 to 4 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
3	R1	2	22	P1	0	0	I1	2	33
	R2	0	0	P2	2	25	I2	1	17
	R3	2	22	P3	2	25	I3	0	0
	R4	4	44	P4	3	38	I4	3	50
	R5	1	11	P5	1	13	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	9	100	Total	8	100	Total	6	100

Fig. K.2 Stack profile for K in week 3

Week 4

In the 'hello song', the teacher sang 'hello' in greeting K, and K waited for about 18 seconds before she pressed the switch to say, 'hello' back to the teacher (R4A, P2C, I2C). The second time that the teacher sang the 'hello song' in greetings to her, K again waited for 25 seconds before pressing the switch to say her 'hello' back to fit in with the song. Then she pressed it once again to sing 'hello' (R4A, P2C, I2C). She tried hard to press the switch but had difficulty in managing her movements and controlling her

muscles.

In considering the pauses in the song 'bells in the steeple', the teacher demonstrated pauses of two and pauses of three, by clapping and chanting, and asked the students to choose. The teacher asked K 'is it two or three?' and he particularly waited a longer time for K to switch the right answer. K waited for about 12 seconds before pressing the switch (R3B, P3D).

A few students were appointed to count 'one, two, three' to keep the basic beat going while another three students sang the song 'bells in the steeple' with the counting. K also pressed the switch to activate the counting on 'one, two, three' and when she had finished, she pressed the switch again (R3B, P3B, I2C). However, the singing and counting did not synchronise so the teacher turned off K's switch before it had finished. Later, K was appointed to be the leader for counting. She waited for about 9 seconds before she pressed the switch once to activate the counting for the whole song – with other students counting 'one, two, three' and another group of students singing the song (R3B, P3B, I3B). The teacher was pleased with their good performance.

When the teacher instructed the students to pause and sing the song 'bells in the steeple', K was helped by the TA to do the conducting, twice (R2D, I2D). The teacher recorded the pause 'umm cha cha' on K's switch. K waited for about 24 seconds before she pressed the switch to activate the chanting and the teacher played the drum and the cymbal in accompaniment. On the second practice, another student played the drum and cymbal to go along with K's switch chantings and there was less waiting time for K to press the switch (R3B, P3B, I3B). On the third practice, immediately after the teacher had said 'are you ready?' K pressed the switch to activate the chanting to go along with the student's instrumental playing on 'umm' for the drum and 'cha cha' for the cymbal (R3B, P3B).

When the teacher asked another student to play the drum and cymbal according to the pause 'umm cha cha' in a much slowed tempo and was about to turn off K's switch, K pressed her switch immediately to activate the chanting 'umm cha cha' despite it not being her turn (P2C, R2C, I2C). Later, the teacher assigned H to do the 'umm' on the drum and K to do the 'cha cha' on the cymbal for the second and the third beat in the interactive activity. K was fully prompted twice by the teacher on the instrumental playing (P1D, I1D).

In reviewing the notes in the song 'bells in the steeple', the teacher demonstrated the hand sign when he sang the notes 'do, mi, so' which corresponded to the low, middle

and high notes. The teacher recorded on K's switch the singing of these notes for the song 'bells in the steeple'. K waited for 29 seconds before she activated the singing that the teacher recorded on the switch, for the first phrase, and about 49 seconds for the second phrase (R3A, P2D).

In a choice making activity, the teacher played for the whole class two pieces of music and wanted the students to decide which piece they liked the best. The teacher and a TA both asked K the same question to make sure that she understood and K pressed the switch 'that's the one' in response (R4A, P3D). However, when K was being presented with two switches, 'that's the one' and 'next one', her answer for her favourite piece was confusing and not consistent. Table K.3 summarises the coding in week 4 for K:

Table K.3 The raw data table for K in week 4

		Domain Categorisation			Element Matching					
					R		P		I	
4	K026	1	1	1	4	A	2	C	2	C
4	K027	1	1	1	4	A	2	C	2	C
4	K028	1	1		3	B	3	D		
4	K029	1	1	1	3	B	3	B	2	C
4	K030	1	1	1	3	B	3	B	3	B
4	K031	1		1	2	D			2	D
4	K032	1		1	2	D			2	D
4	K033	1	1	1	3	B	3	B	3	B
4	K034	1	1		3	B	3	B		
4	K035	1	1	1	2	C	2	C	2	C
4	K036		1	1			1	D	1	D
4	K037	1	1		3	A	2	D		
4	K038	1	1		4	A	3	D		

The following stack profile (Fig. K.3) summarises the musical development mapping in week 4 for K. Her musical behaviours ranged from level 2 to 4 in the reactive domain, level 2 to 3 in the proactive and level 1 to 3 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
4	R1	0	0	P1	1	9	I1	1	11
	R2	3	25	P2	4	36	I2	6	67
	R3	6	50	P3	6	55	I3	2	22
	R4	3	25	P4	0	0	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	12	100	Total	11	100	Total	9	100

Fig. K.3 Stack profile for K in week 4

Week 5

The researcher recorded the singing 'dol dol dol, mi mi mi, sol sol sol, mi. dol mi sol, dol mi sol, dol mi sol, dol'

1 1 1 | 3 3 3 | 5 5 5 | 3 – – | 1 3 5 | 1 3 5 | 1 3 5 | 1 – – ‖ on the switch. K waited for 10 seconds and then she pressed the switch to sing the first phrase and she waited for 4 seconds to press the second phrase to link the two phrases together. The waiting time was obviously shorter for the second phrase (R4A, P4B). Later, the teacher held K's hand to conduct three beats, while singing the notes of the song (P1B, I1B).

In taking turns with the teacher, K needed to press the switch to sing the second and fourth phrase of the song 'bells in the steeple' while the teacher tapped the rhythm on her tray for the first and third phrases. Because of the disruption caused by another student's giggling, K also laughed instead of doing her work. After the teacher gained control and helped K to focus, K waited for about 50 seconds before pressing the switch for the second phrase 'how sweetly they ring' (3 | 5 5 5 | 3 – – |). Then the teacher tapped on K's tray again for the third line. K pressed the switch for the 'ding ding dong ding' (1 3 5 | 1 – – ‖) after two seconds (P4C, I4D) to finish the song.

In the role-play, the teacher set up a funfair scenario by appointing one student to be king who had to greet his subjects by waving his hand as the teacher wheeled him into the hall. The researcher played C, E and G notes on the piano to create a kind of funfair music in the background. While watching the action show with background music, K kept laughing and vocalising (P2C, I2D). The teacher then recorded 'good morning your

majesty' on K's switch and K laughed in a loud voice. K waited for 7 seconds and pressed her switch to say her words in the role-play. Then she pressed the switch again (P3D, I2D).

In composing their own funfair music, K was given three switches in front of her which represented three notes on C, E and G. She improvised and pressed the notes to form a simple and straightforward musical piece: C C C E, C C E G G C. When the teacher asked K to do it again, K pressed the switches on C C E and then she waited for 23 seconds before pressing the switch again on the notes G G G E E C to finish her composition. The teacher then said to K, 'what a fantastic composer you are. I like the way you choose different notes very nicely' (R5B, P5B).

After some individual practices when working with a TA, K performed her funfair music again in front of the class by pressing different switches on the order of C C E E G G E C E C C C. She did very well, with little waiting time between the notes, (R5B, P5B) and showed confidence in completing the task. Table K.4 summarises the coding in week 5 for K:

Table K.4 The raw data table for K in week 5

		Domain Categorisation			Element Matching					
					R		P		I	
5	K039	1	1		4	A	4	B		
5	K040		1	1			1	B	1	B
5	K041		1	1			4	C	4	D
5	K042		1	1			2	C	2	D
5	K043		1	1			3	D	2	D
5	K044	1	1		5	B	5	B		
5	K045	1	1		5	B	5	B		

The following stack profile (Fig. K.4) summarises the musical development mapping in week 5 for K. Her musical behaviours ranged from level 4 to 5 in the reactive domain, level 1 to 5 in the proactive and level 1 to 4 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 4 and 5 and the interactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
5	R1	0	0	P1	1	14	I1	1	25
	R2	0	0	P2	1	14	I2	2	50
	R3	0	0	P3	1	14	I3	0	0
	R4	1	33	P4	2	29	I4	1	25
	R5	2	67	P5	2	29	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	3	100	Total	7	100	Total	4	100

Fig. K.4 Stack profile for K in week 5

Week 7

Week 7 was near the school half term. In week 7, the teacher did a music lesson on ICT. The aims of the lesson were to open a software, to arrange some music on it, to save the composition and give it a name. K was working with one of her classmates on one computer. The teacher held K's hand to use the mouse to open the 'garageband' programme (P1A, I1A). When the teacher was working with other students, K closed her eyes and did not interact with the technology. When the teacher came to their group and worked with K, the teacher fully prompted her to put the bass line to the start of the song 'bells in the steeple'.

K was exposed to the musical sound arrangement activity by using the computer software 'Garageband'. Due to her physical difficulties, K was not able to control the mouse and achieve the objectives of the lesson. Most of the tasks were fully prompted by the teacher (R1C, P1C, I1C). While the teacher was working with other groups to try out new sounds of different instruments, K made some sounds in order to seek the staff's attention (P2B, I2B).

In decision making on different instrumental sounds, the teacher asked K to choose either the saxophone or flute, and K indicated that the flute sound should be used in their computer music. The teacher then played back their choice of recording on the new arrangement and asked four or five times if K liked it or not. K seemed to indicate that she liked the music (R2B, I1C). The teacher also helped K's group to pick up the third voice (falling star) and a jazz bass for their song.

When the teacher demonstrated how to put percussion into their composition and made it into a loop, K made some vocalisation and it seemed to relate to the Congo drum playing in the loop, or the melody that appeared later on (R2B, P2C, I2D).

K seemed to have good eye contact with the teacher when their music was played in the class. Everyone listened to their group work from the computer (R1D, P1D). When the teacher asked the students to click on the 'Garageband' to shut down the programme, K vocalised (P2B, I2B). Later, K also seemed to be excited and vocalised (P2B, I2B). She seemed happy to know that the lesson had finished and that they were going to have a CD of their own composition next week. It was not clear about the reason for her vocalisation. Table K.5 summarises the coding in week 7 for K:

Table K.5 The raw data table for K in week 7

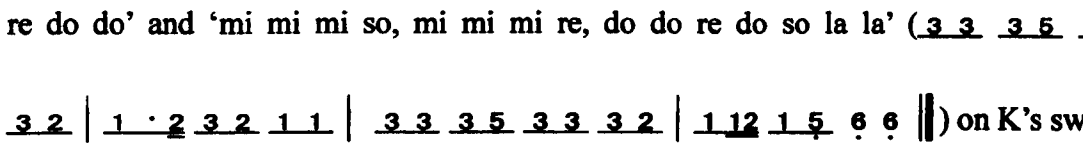
		Domain Categorisation			Element Matching					
					R		P		I	
7	K046		1	1			1	A	1	A
7	K047	1	1	1	1	C	1	C	1	C
7	K048		1	1			2	B	2	B
7	K049	1		1	2	B			1	C
7	K050	1	1	1	2	B	2	C	2	D
7	K051	1	1		1	D	1	D		
7	K052		1	1			2	B	2	B
7	K053		1	1			2	B	2	B

The following stack profile (Fig. K.5) summarises the musical development mapping in week 7 for K. Her musical behaviours ranged from level 1 to 2 in the reactive domain, level 1 to 2 in the proactive and level 1 to 2 in the interactive domain. The modes for the reactive domain located at level 1 and 2, the proactive domain at level 2 and the interactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
7	R1	2	50	P1	3	43	I1	3	43
	R2	2	50	P2	4	57	I2	4	57
	R3	0	0	P3	0	0	I3	0	0
	R4	0	0	P4	0	0	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	4	100	Total	7	100	Total	7	100

Fig. K.5 Stack profile for K in week 7

Week 9

After the school's half term, the students returned in week 9. The teacher introduced a new song and he recorded the song in two phrases 'mi mi mi so, mi mi mi re, do re mi re do do' and 'mi mi mi so, mi mi mi re, do do re do so la la' () on K's switch.

K was asked to sing this song while using her switch. K waited for 30 seconds before she activated the singing of the first phrase. However, on the second line, she pressed the switch with no delay and in good timing (R3C, P3A). When the teacher asked K to do it again, K pressed the switch in good timing for the first phrase. She waited about 7 seconds before she pressed the switch for the second phrase (R4B, P4B). On the third practice, K made a really good performance on both the first and second phrases using the switch in time (R5A, P5A). The teacher commented, 'Good work, K. Fantastic. I liked the way you were looking at the switch and listening well to your instructions. That was very good work'.

Later (in about eight minutes time) the teacher asked K to do the same task again, K started laughing and then she pressed the switch to activate the first and second line roughly in good timing (R5A, P5A). Following the same task on the second practice, K laughed and waited for about 14 seconds before pressing the switch to activate the first phrase. Again because of laughing, she had to wait 25 seconds before pressing the switch for the second phrase (R4B, P4B).

At times, it seemed difficult for K to make choices. When the teacher offered K alternatives (either singing or pausing), K did not look at the teacher's hands which represented the choices, but only at her tray, or she would look at both the teacher's hands. With the help of a TA with whom K was familiar, K made the choice of doing the singing part and then she indicated that she wanted a student to be her partner (R2B, P2B, I2C). The teacher recorded the singing part on the switch. Another student, being K's partner, played a drum and kept a steady beat in time with K's switching. K pressed the switch, with 10 seconds delay, to sing throughout the song. After the song had finished, K pressed it again, initiated by herself with no delay (R4B, P4B, I4D). On her own initiative, K pressed the switch again when the song had finished (R5A, P4B, I5A) and her partner beat the drum. K started laughing after she had completed the task.

When the teacher was giving instructions to the drummer about the ending, K decided to press the switch again to activate the singing part, in good timing, but the teacher turned K's switch off and wanted her to start again with the drummer. K then pressed

the switch again to sing the song, but this time, her partner seemed to lose his control of keeping a steady beat (R5A, P4B, I4D).

In the interactive activity, the teacher sang parts of the song and K needed to press the switch to do the ending on the notes 5 6 6. In some of the practices, even though K needed to be reminded about her waiting time, K pressed the switch correctly on the note 5 6 6 when taking turns with the teacher who sang 3 3 3 5 3 3 3 2 | 1 · 2 3 2 1 1 | 3 3 3 5 3 3 3 2 | 1 12 1 (R5C, P5A, I5A) twice. Everyone in the class clapped her.

On the task of reading a poem, the teacher recorded a rhyme on K's switch in two phrases. The first line of the poem was 'Jack be nimble, Jack be quick' and the second line was 'Jack jumped over the candle stick'. The teacher asked K to press the switch and K pressed the switch four times in very good timing and with no pauses between the phrases (R4B, P4B).

In the music listening, K was asked to distinguish whether a song came from France or Russia. K chose France and when she heard the teacher's comment about her correct answer, she vocalised briefly (R2C, P2C, I2C). Table K.6 summarises the coding in week 9 for K:

Table K.6 The raw data table for K in week 9

		Domain Categorisation			Element Matching					
					R		P		I	
9	K054	1	1		3	C	3	A		
9	K055	1	1		4	B	4	B		
9	K056	1	1		5	A	5	A		
9	K057	1	1		5	A	5	A		
9	K058	1	1		4	B	4	B		
9	K059	1	1	1	2	B	2	B	2	C
9	K060	1	1	1	4	B	4	B	4	D
9	K061	1	1	1	5	A	4	B	5	A
9	K062	1	1	1	5	A	4	B	4	D
9	K063	1	1	1	5	C	5	A	5	A
9	K064	1	1	1	5	C	5	A	5	A
9	K065	1	1		4	B	4	B		
9	K066	1	1	1	2	C	2	C	2	C

The following stack profile (Fig. K.6) summarises the musical development mapping in week 9 for K. Her musical behaviours ranged from level 2 to 5 in the reactive domain, level 2 to 5 in the proactive and level 2 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 4 and the interactive domain at level 5, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
9	R1	0	0	P1	0	0	I1	0	0
	R2	2	15	P2	2	15	I2	2	29
	R3	1	8	P3	1	8	I3	0	0
	R4	4	31	P4	6	46	I4	2	29
	R5	6	46	P5	4	31	I5	3	43
	R6	0	0	P6	0	0	I6	0	0
	Total	13	100	Total	13	100	Total	7	100

Fig. K.6 Stack profile for K in week 9

Week 10

In the beginning of the lesson, K initiated to switch and produce the singing 'bla bla bla' in two phrases on the melody of (3 3 3 5 3 3 3 2 | 1 · 2 3 2 1 1 | 3 3

3 5 3 3 3 2 | 1 12 1 5 6 6 ‖). Following the teacher's instruction, K linked the two phrases in good timing (R4B, P4B, I4B). She was asked to do the task again and K did so. She only had 3 seconds delay between the phrases (R4B, P4B, I4B).

In the group ensemble performance, a student used a switch to do the singing on (3 3 3 5 3 3 3 2 | 1 · 2 3 2 1 1 | 3 3 3 5 3 3 3 2 | 1 12 1 5 6 6 ‖). Another two students kept a steady beat while chanting 'one two, one two'. K was helped by the teacher to tap and count 'ti ti ta' (♪♪ ♩) on her tray to go with the song (P1B, I1B). The students formed a good ensemble for the performance.

The teacher wanted the students to listen to the song again to see whether they could notice something new. K was asked to sing the whole song by pressing her switch which resulted in (𝄆 3 3 3 5 3 3 3 2 | 1 · 2 3 2 1 1 | 3 3 3 5 3 3 3 2 | 1 12 1 5 6 6 𝄇) and the teacher sang a different melody to go with the song (6 7 1 7 1 7 6 | 6 7 1 7 6 6 | 6 7 1 7 1 7 6 | 6 7 1 7 6 6 | 3 2 1 7 1 7 6 | 6 7 1 2 3 3 | 3 2 1 7 1 7 6 | 6 7 1 7 6 6 ‖) to form two different harmonic lines in the song (R4B, P4A, I4B). The whole class was asked to listen again to see whether the teacher sang the same song as K, or whether it was different. Just after the teacher had finished talking, K pressed the switch and followed the instruction well – with no delay in pressing the switch twice to produce a woman's voice in singing (the first was in a man's voice) (R4B, P4A, I4B).

In doing the same task again, K waited for 10 seconds before she pressed the switch to sing the song in a man's singing voice. After following the instruction from the teacher, K pressed the switch again to produce a woman's singing voice well in time (R4B, P4A, I4B). While the teacher recorded his second singing part on the switch, K made a few fleeting sounds (R4A, P2C).

The teacher recorded on K's switch a sentence from a poem 'Jack jumped over' (♪♪ ♪♪) in four crochets' rhythm for four times. It took K about 10 seconds to press the switch after the teacher's instruction. K initiated to press the second time in good timing

as soon as the chanting had finished (R4A, P3A).

In pair ensemble work, a student was asked to chant the phrase 'Jack jumped over' (♪♪♪♪) to keep a nice and steady beat for K. K needed to say the poem 'Jack be nimble, Jack be quick, Jack jumped over the candle stick' (♪♪ ♪♪ . | ♪♪ ♩ | ♪♪ ♪♪♪ | ♪♪ ♩ ‖) by pressing the switch. K switched in good timing to read the poem with another student chanting 'Jack jumped over' along with the poem (R4A, P4A, I4D). When asked to do the same task again, K switched in good timing to read the poem once while the other student chanted 'Jack jumped over' partially independently (R4B, P4A, I4D). Table K.7 summarises the coding in week 10 for K:

Table K.7 The raw data table for K in week 10

		Domain Categorisation			Element Matching					
					R		P		I	
10	K067	1	1	1	4	B	4	B	4	B
10	K068	1	1	1	4	B	4	B	4	B
10	K069		1	1			1	B	1	B
10	K070	1	1	1	4	B	4	A	4	B
10	K071	1	1	1	4	B	4	A	4	B
10	K072	1	1	1	4	B	4	A	4	B
10	K073	1	1		4	A	2	C		
10	K074	1	1		4	A	3	A		
10	K075	1	1	1	4	B	4	A	4	D
10	K076	1	1	1	4	B	4	A	4	D

The following stack profile (Fig. K.7) summarises the musical development mapping in week 10 for K. Her musical behaviours ranged from level 4 in the reactive domain, level 1 to 4 in the proactive and level 1 to 4 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
10	R1	0	0	P1	1	10	I1	1	13
	R2	0	0	P2	1	10	I2	0	0
	R3	0	0	P3	1	10	I3	0	0
	R4	9	100	P4	7	70	I4	7	88
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	9	100	Total	10	100	Total	8	100

Fig. K.7 Stack profile for K in week 10

Week 11

This was the last week that K attended the music lesson before the school's Easter break. This week was a Red Nose Day[1] and the teacher printed out the words from this year's song. He gave each student different words that were muddled up. The students were asked to work together and to put the words in the right order. The music teacher started to play the song and checked each musical phrase according to the words that the students and TAs had. K was fully prompted by the teacher's help to recognise her words while listening to the music (R1B, P1D, I1B). K's words for the song were 'do what you can to make a difference somewhere'.

When following the teacher's instruction, K waited well and pressed her switch in good timing with the words 'do what you can to make a difference somewhere' (R4B, P4B, I4B). However, at times, K would press her switch to sing her phrase which was not in the right order of the song (R3C, P3C, I2C). Later, K pressed the switch in good timing on her phrase right after the other student finished his singing in the right order (R4C, P4B, I4B). Then after her phrase had finished, K pressed the switch again to sing the phrase once more.

While singing with the CD recording, K pressed the switch, with a few seconds delay, but she participated in the activity four times during that day's lesson, although her switch singing was not always exactly in time with the recording (R3C, P3A, I3C).

After several practices and after the teacher had turned the CD's volume down, K pressed the switch in time, and the 'switch's singing' matched exactly with the

[1] Red Nose Day was a fund raising event organised by Comic Relief. The fund raising took place in schools, offices and homes across the UK. BBC One also broadcast a night of comedy, which includes celebrities got up to all kinds of mischief, to make the Red Nose Day phenomenon. The event was aiming to make a difference to the lives of thousands of people (http://www.rednoseday.com/).

recording accompaniment (R3A, P3A, I3A). It was not clear if K had pressed the switch alone or whether a TA had held her hand to press it. The teacher commented on K's performance, 'K, you did some really good work with your switch there. I'm very very impressed. Well done'. After hearing the teacher's comment, K pressed the switch again to sing her phrase as an acknowledgement (R2C, P2C, I2C).

The teacher recorded the poem 'Jack be nimble, Jack be quick, Jack jumped over the candle stick' (𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥𝅯𝅘𝅥𝅯 . | 𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥 | 𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯 | 𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥 ‖) on a switch and asked K to read the whole poem by pressing the switch. K pressed the switch in good timing by following the teacher's instructions both times (R3C, P3C).

In pair ensemble work, K pressed the switch to read the whole poem while the other student chanted 'nimble quick' (𝅘𝅥𝅯𝅘𝅥𝅯 . | 𝅗𝅥) throughout the poem. K's switching was roughly in time following the teacher's instructions. The ensemble rhythmic chanting went well (R4B, P4B, I4D).
At times, K would press the switch by herself when the teacher was assigning different jobs to different people, or asking someone a question, and a TA would quickly turn off K's switch because the context was not right (P2C).

When the teacher suggested putting some drumming into the poem, K vocalised a few seconds while hearing the word 'drum' and the drum sounds. She also had fleeting vocalisation and laughing when she heard a cymbal playing the rhythm of the rhyme (R3C, P3D).

In group ensemble practice, one group of students was in charge of doing the taping and chanting of 'nimble quick, nimble quick' (𝅘𝅥𝅯𝅘𝅥𝅯 . | 𝅗𝅥). Another student was in charge of 'Jack jumped over, Jack jumped over' (𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥𝅯𝅘𝅥𝅯). Another student was to say the words 'Jack be nimble, Jack be quick, Jack jumped over the candle stick' (𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥𝅯𝅘𝅥𝅯 . | 𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥 | 𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯 | 𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥 ‖). The other student used the drum on the switch. K was assigned to keeping the pause going really steadily. A TA held K's hand to beat a steady pause to go along with the chanting (R2C, P1B, I1B). The teacher then commented that K was a star.

In music listening time, K vocalised towards the music and she was very excited (R3B, P2B). When the teacher introduced the original place for the music and the dance, K vocalised towards the teacher's comment on 'it's famous for oranges'. (R2A, P2B, I2A). When the teacher played the Spanish dance music again, K vocalised towards the music and the teacher's dancing, with excitement (R3B, P2B).

Later on, one of the students brought in his favourite CD to be shared in the music lesson. The teacher played the CD on the song 'I get a kick out of you' by Frank Sinatra. While she was listening to the music, K vocalised excitedly in a high pitched voice (R4A, P3D). Table K.8 summarises the coding in week 11 for K:

Table K.8 The raw data table for K in week 11

		Domain Categorisation			Element Matching					
					R		P		I	
11	K077	1	1	1	1	B	1	D	1	B
11	K078	1	1	1	1	D	1	C	1	B
11	K079	1	1	1	4	B	4	B	4	B
11	K080	1	1	1	3	C	3	C	2	C
11	K081	1	1	1	4	C	4	B	4	B
11	K082	1	1	1	3	C	3	A	3	C
11	K083	1	1	1	3	C	3	A	3	C
11	K084	1	1	1	3	A	3	A	2	C
11	K085	1	1	1	3	A	3	A	3	A
11	K086	1	1	1	3	C	3	A	3	A
11	K087	1	1	1	2	C	2	C	2	C
11	K088	1	1		3	C	3	C		
11	K089	1	1	1	4	B	4	B	4	D
11	K090		1				2	C		
11	K091	1	1		3	C	3	D		
11	K092	1	1	1	2	C	1	B	1	B
11	K093	1	1		3	B	2	B		
11	K094	1	1	1	2	A	2	B	2	A
11	K095	1	1		3	B	2	B		
11	K096	1	1		4	A	3	D		

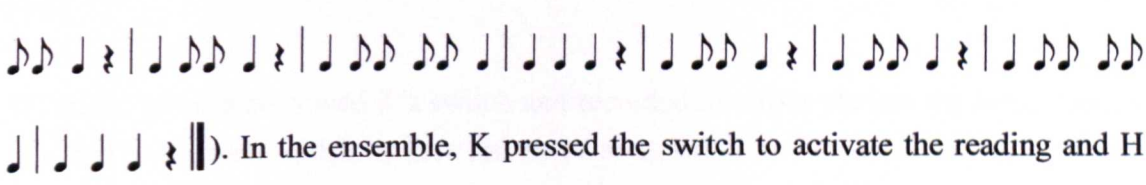
The following stack profile (Fig. K.8) summarises the musical development mapping in week 11 for K. Her musical behaviours ranged from level 1 to 4 in the reactive domain, level 1 to 4 in the proactive and level 1 to 4 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 2 and 3, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
11	R1	2	11	P1	3	15	I1	3	21
	R2	3	16	P2	5	25	I2	4	29
	R3	10	53	P3	9	45	I3	4	29
	R4	4	21	P4	3	15	I4	3	21
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	19	100	Total	20	100	Total	14	100

Fig. K.8 Stack profile for K in week 11

Musical behaviours and development of K in term two (the school summer term): weeks 14 to 23

Week 14

After the school Easter break, the students came back to the school in week 14. In pair ensemble work, K chose H to be her partner. The teacher recorded a six phrase rhyme on K's switch, namely 'Pease pudding hot, pease pudding cold, pease pudding in the pot nine days old. Some like it hot, some like it cold, some like it in the pot nine days old' (). In the ensemble, K pressed the switch to activate the reading and H tapped a sound on the tambour at the end of each rhythmic phrase. K moved her arm over and pressed the switch to activate the reading with good timing in taking turns with H on all the phrases of the rhyme (R4B, P4B, I4B). On the second practice, K pressed the switch in very good timing when taking turns with H. In the middle, she waited a few seconds before she pressed the switch on one of the phrases (R4B, P4B, I4B).

In a group ensemble work, the students needed to choose to tap, clap or stamp at the end of each rhythmic phrase of 'pease pudding hot'. K chose to tap on her tray and she

vocalised a little to answer the teacher and staff's questions (P3D). The teacher played the drum for the rhythmic patterns of the rhyme and the students were supposed to make their sounds at the end of each phrase. A TA held K's hand to tap on her tray after each rhythmic drumming pattern by the teacher (R3C, P1B, I1B).

In further development of this activity, the teacher played the tune that went with the rhyme on the piano (1 1 2 3 | 4 4 4 3 | 1 1 2 3 3 3 | 2 2 1 ||) and the students were instructed to tap a sound at the end of each phrase. The teacher played the tune on the piano and a TA held K's hand to tap on her tray (R3C, P1B, I1B). The teacher recorded the singing

(1 1 2 3 | 4 4 4 3 | 1 1 2 3 3 3 | 2 2 1 ||) into four phrases and asked K to sing the song. K waited for about 5 seconds before pressing the switch for the first phrase. For the rest of the phrases, without any help – her pressing on the switch was well timed (R5A, P5A). Even a TA commented that 'she is doing really good, isn't she?' K then pressed the switch herself for an extra round.

In an interactive activity, K and another student took turns to sing the song. K was supposed to sing the first and third phrases and the other student needed to tap the second phrase on his tray. When the teacher recorded the first and third phrases on the switch, K had fleeting reflected vocalisation. When K pressed the switch, she did it twice to sing the first and third phrases without giving the other student a chance to tap on his tray (R3A, P2C). The teacher wanted the students to do the task again. This time K waited about 10 seconds before pressing the switch for the first phrase. Then K waited for about 25 seconds before pressing the switch for the third phrase (R4B, P4A, I4B).

When the teacher borrowed K's switch and recorded into four phrases the song 'Once a man fell in the well, splish, splash, splush he sounded, if he had not fallen in, he would not have drowned'

(1 2 3 4 5 5 5 | 1 2 3 4 5 5 | 1 2 3 4 5 5 5 | 5 4 3 2 1 1), K had fleeting vocalisation towards the teacher's singing (R4A, P2B). Table K.9 summarises the coding in week 14 for K:

Table K.9 The raw data table for K in week 14

		Domain Categorisation			Element Matching					
					R		P		I	
14	K097	1	1	1	4	B	4	B	4	B
14	K098	1	1	1	4	B	4	B	4	B
14	K099		1				3	D		
14	K100	1	1	1	3	C	1	B	1	B
14	K101	1	1	1	3	C	1	B	1	B
14	K102	1	1		5	A	5	A		
14	K103	1	1		3	A	2	C		
14	K104	1	1	1	4	B	4	A	4	B
14	K105	1	1		4	A	2	B		

The following stack profile (Fig. K.9) summarises the musical development mapping in week 14 for K. Her musical behaviours ranged from level 3 to 5 in the reactive domain, level 1 to 5 in the proactive and level 1 to 4 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
14	R1	0	0	P1	2	22	I1	2	40
	R2	0	0	P2	2	22	I2	0	0
	R3	3	38	P3	1	11	I3	0	0
	R4	4	50	P4	3	33	I4	3	60
	R5	1	13	P5	1	11	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	8	100	Total	9	100	Total	5	100

Fig. K.9 Stack profile for K in week 14

Week 15

The teacher recorded the singing

(1 1 2 3 𝄽 | 4 4 4 3 𝄽 | 1 1 2 3 3 3 | 2 2 1 𝄽 𝄽) on K's switch. K switched the phrases roughly in time while the teacher played on the piano the tune of the song which formed a good ensemble (R5A, P4B, I4D). On the second round, K waited for about 10 seconds before she pressed the first phrase (1 1 2 3 𝄽 |) and in time for the

second phrase (4 4 4 3 𝄽 |), and she waited for about 6 seconds before pressing the switch for the third phrase (1 1 2 3 3 3 | 2 2 1 𝄽 ‖). In general, K and the teacher had a nice little ensemble (R5A, P4B, I5A).

In pair ensemble work, K chose H to be her partner for the task. Both of them sat face to face and K used her switch to sing the song, and H and the teacher did the clapping at the end of each musical phrase. K's switching was roughly in time and she waited for about 5 seconds before she pressed the next phrase. She took turns well with H (R5A, P4B, I4D).

On the practice of an interactive group activity, each student was assigned different notes. One student was being 'do' and the other students were being 're', 'mi', or 'fa'. K was in the clapping group and the teacher recorded the clapping on the switch for K. She made a fleeting reaction towards the clapping sounds. K switched the clapping on the pause part near the end of the song (R3C, P3A, I2C). On another practice of the same task, and following the teacher's instruction, K switched the clapping between two phrases well and roughly in time (R4B, P4B, I4D). On the third practice, the teacher wanted the students to do the song and in the right order by themselves without instructions, but the students who represented different notes improvised another tune for the song. K also switched the clapping along with the other students' improvisation (R3C, P3A, I2C).

The teacher and the students tried again doing the same task. The teacher gave clear instructions and near the end of the song, K switched the clapping roughly in the right place. The first time K's switching was too quick but the second time was in time and in the right order. The third time was too quick as she did not wait long enough for others to finish their phrases, and on the fourth time she was in time and in the right order for taking turns with the other students (R4B, P4B, I4D). After the activity had finished, she pressed the switch again to produce clapping sounds.

The teacher assigned a short music motif to each student. One student had a music phrase (5 3 5 4 | 3 – – –) and the other had a musical phrase (5 4 3 2 | 1 – – –). H had a musical phrase (5 3 4 3 | 2 – – –) and K had a musical phrase (3 4 3 3 | 2 3 – –). When she took turns with other students, K

waited about 8 seconds, before pressing the switch after the teacher had called out her name (R4B, P4B, I4D). At another practice, K pressed in good timing after the teacher's instruction (R4B, P4B, I4D). Later on, K twice pressed the switch when it was not her turn, and she laughed (R4B, P3C, I3C).

In recognising and distinguishing each student's own music phrase, the teacher played somebody's tune on the piano. He sang the motif and asked the students if they thought it was their tune. If it was, they needed to hit their switch or sing it back to the teacher. When the teacher sang 3 4 3 3 | 2 3 – – ‖, K pressed the switch immediately just after the teacher had sung her phrase, and then she pressed it again (R4A, P4A, I4A). The teacher smiled and commented afterwards, 'K, You knew you were right'. Table K.10 summarises the coding in week 15 for K:

Table K.10 The raw data table for K in week 15

		Domain Categorisation			Element Matching					
					R		P		I	
15	K106	1	1	1	5	A	4	B	4	D
15	K107	1	1	1	5	A	4	B	5	A
15	K108	1	1	1	5	A	4	B	4	D
15	K109	1	1	1	3	C	3	A	2	C
15	K110	1	1	1	4	B	4	B	4	D
15	K111	1	1	1	3	C	3	A	2	C
15	K112	1	1	1	4	B	4	B	4	D
15	K113	1	1	1	4	B	4	B	4	D
15	K114	1	1	1	4	B	4	B	4	D
15	K115	1	1	1	4	B	3	C	3	C
15	K116	1	1	1	4	A	4	A	4	A

The following stack profile (Fig. K.10) summarises the musical development mapping in week 15 for K. Her musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 4 in the proactive and level 2 to 5 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
15	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	2	18
	R3	2	18	P3	3	27	I3	1	9
	R4	6	55	P4	8	73	I4	7	64
	R5	3	27	P5	0	0	I5	1	9
	R6	0	0	P6	0	0	I6	0	0
	Total	11	100	Total	11	100	Total	11	100

Fig. K.10 Stack profile for K in week 15

Week 16 (start of video recording)

Week 16 was the week before the school break. K did not look alert or well and her head was down when she came into the lesson. The teacher asked K to press the switch to sing the song 'once a man fell in the well'. K smiled and looked at the switch but did not move her hands. When the TA tried to look into her eyes and encourage her to press the switch, K pressed the switch several times to twice sing the song. On the second time, she did most of the switching by herself (R4A, P4A). K's mouth opened as others clapped her and her facial expression changed. She then had an eye contact with the TA.

The teacher asked K how many lines were in the song, and offered her two choices. However, K did not seem to be able to make up her mind on four lines or five lines in the song. K's head hung down looking at her tray and she did not look at the teacher's hand which represented the numbers. There was no sign of communication in answer to the teacher's question (P1C, I1A).

The class was divided into two groups. One group did the clapping rhythm and the other group did the singing. K raised up her head when it was her group's turn to tap the rhythm and she looked at the teacher. A TA tapped K's hand when it was their group's turn and then she looked alert and smiled (R2A, P1B, I1C).

In the group interaction, the clapping group clapped the first and the third lines of the song. The singing group switched the singing for the second and the fourth phrases of the song. K was fully prompted by the TA about pressing the switch. K's head was up and she raised her right hand with clenched fist. K had a big smile and opened her mouth and looked at the teacher. She showed awareness of the music and rhythm but could not press the switch in time and needed complete physical assistance in pressing the switch (1D, 1B, 1B) during the activity. Then the teacher changed the singing group into the clapping group and vice versa. K was in the clapping group this time. Because

of her excitement, K raised her hand up in the air. The TA held her hand to tap on the tray when it was her group's turn (2A, 1B, 1B).

At times, K would turn her head to the right hand side and the TA would ask K to relax. On one to one interactive task, the teacher tapped the beat for the thinking voice on the first and the third phrases and it seemed that the teacher partially helped K to switch for the singing voice on the second and the fourth phrases (R4A, P3C, I3B). K smiled.

The teacher asked K to do a 'song drawing' while singing 'bla bla bla' on the melody of the song (1 2 3 4 5 5 5 | 1 2 3 4 5 5 | 1 2 3 4 5 5 5 | 5 4 3 2 1 1). A TA held K's hand to move up and down to do the song drawing according to the up and down of the melody (R2A, P1B, I1B). K was asked to switch the song while the teacher did the hand sign. K seemed to partially press the switch by herself and link the motifs together to sing the song (R5A, P4B, I3C).

The teacher introduced a song

(1 1 2 | 1 1 3 | 1 1 2 | 1 3 4 | 3 3 4 | 3 3 2 | 3 3 4 | 3 2 1 ‖) with a jazz CD accompaniment. A TA partially supported K's hand to press the switch on texts 'yeah, ah ha, hit it, that's cool, yeah, ah ha, hit it, I am done' when the teacher sang the melody. Each word was responded to in the remaining part of the melody. Then the TA put her hand underneath K's elbow for support and partially prompt K to press the switch. It took a longer time for K to press the switch and to respond (R4A, P4A, I4B). She had brief eye contact with the teacher. Table K.11 summarises the coding in week 16 for K:

Table K.11 The raw data table for K in week 16

		Domain Categorisation			Element Matching					
					R		P		I	
16	K117	1	1		4	A	4	A		
16	K118		1	1			1	C	1	A
16	K119	1	1	1	2	A	1	B	1	C
16	K120	1			1	C				
16	K121	1	1	1	1	D	1	B	1	B
16	K122	1	1	1	2	A	1	B	1	B
16	K123	1	1	1	4	A	3	C	3	B
16	K124	1	1	1	2	A	1	B	1	B
16	K125	1	1	1	5	A	4	B	3	C
16	K126	1	1	1	4	A	4	A	4	B

The following stack profile (Fig. K.11) summarises the musical development mapping in week 16 for K. Her musical behaviours ranged from level 1 to 5 in the reactive domain, level 1 to 4 in the proactive and level 1 to 4 in the interactive domain. The modes for the reactive domain located at level 2 and 4, the proactive domain at level 1 and the interactive domain at level 1, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
16	R1	2	22	P1	5	56	I1	5	63
	R2	3	33	P2	0	0	I2	0	0
	R3	0	0	P3	1	11	I3	2	25
	R4	3	33	P4	3	33	I4	1	13
	R5	1	11	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	9	100	Total	9	100	Total	8	100

Fig. K.11 Stack profile for K in week 16

Week 17

In helping the students to understand the story and performance of Carmen the opera, the teacher took the students to watch the Carmen performance on TV. While the students watched the tape, the teacher asked them several questions, e.g. someone important is coming on to the screen. Who is this person? Is he the head teacher? What's his job? K vocalised a few seconds towards the teacher's question and the music that they had heard (R2C, P2A).

When the teacher asked K about the tempo of the Carmen music, he used two hands to represent the fast and slow tempo for K to look and choose. K often had her head down and seemed to move her head arbitrarily. Then by looking at one of the teacher's hands, she seemed to indicate that the music was fast (R2B). Table K.12 summarises the coding in week 17 for K:

Table K.12 The raw data table for K in week 17

		Domain Categorisation			Element Matching					
					R		P		I	
17	K127	1	1		2	C	2	A		
17	K128	1			2	B				

The following stack profile (Fig. K.12) summarises the musical development mapping in week 17 for K. Her musical behaviours ranged from level 2 in the reactive domain, level 2 in the proactive. The modes for the reactive domain located at level 2, the proactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
17	R1	0	0	P1	0	0	I1	0	0
	R2	2	100	P2	1	100	I2	0	0
	R3	0	0	P3	0	0	I3	0	0
	R4	0	0	P4	0	0	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	2	100	Total	1	100	Total	0	0

Fig. K.12 Stack profile for K in week 17

Week 18

Week 18 was the week before half term and the school inset day. While the class was watching the TV for Carmen's toreador song, K pressed her switch to produce the cheering sounds (R4A, P3D) – which matched the context on the TV.

In the role-play, the teacher asked the students to play the toreador scene in the class. At first, the teacher acted as the toreador and K was assigned to be a bull. The audience had to cheer every time the bull charged. When the teacher recorded the bull's sound on K's switch, she gave big smiles, together with a soft and brief sound. A TA who was

working with K made many facial expressions and eye contact when talking to K. It seemed to help K's understanding of the class context. The TA held K's hand to press the switch to produce the bull's sounds and pushed her wheelchair so that she could be the bull. K smiled when the TA pushed her to charge the toreador (R4D, P1B).

When the class got together to compose their own marching music, they listened to different drumming sounds on the computer. The TA held K's hand to tap the rhythm of the drum beat. K vocalised more enthusiastically and smiled (R4A, P1B). Later, with the drumming and simple tune background music, the TA held K's hand and tapped the beat on her hand. K looked at the TA constantly with a big smile (R3B, P1B). When the teacher tried out a new bass sound, the loud sounds made some students jump. K vocalised and pressed the switch to make the bull sounds and when she heard them she smiled (R3A, P2C).

While the teacher tried out different drumming patterns and asked K if she liked them, K made some movement by stretching her left hand but was not successful in pressing the switch. This was then interpreted as if she did not like that drumming pattern. After a few minutes, she succeeded in pressing the switch which recorded, 'I like it' and she did it three times (R3A, P3D, I2A).

When the teacher played the march music that the group had chosen for that day's lesson, K pressed the switch 'I like it' five times (R3A, P3D). In order to confirm K's answer, the teacher asked K 'do you like it?' after a long pause, K pressed the switch 'I like it' again (R3A, P2D). Table K.13 summarises the coding in week 18 for K:

Table K.13 The raw data table for K in week 18

		Domain Categorisation			Element Matching					
					R		P		I	
18	K129	1	1		4	A	3	D		
18	K130	1	1		4	D	1	B		
18	K131	1	1		4	A	1	B		
18	K132	1	1		3	B	1	B		
18	K133	1	1		3	A	2	C		
18	K134	1	1	1	3	A	3	D	2	A
18	K135	1	1		4	A	3	D		
18	K136	1	1		3	A	3	D		
18	K137	1	1		3	A	2	D		

The following stack profile (Fig. K.13) summarises the musical development mapping in week 18 for K. Her musical behaviours ranged from level 3 to 4 in the reactive domain, level 1 to 3 in the proactive and level 2 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
18	R1	0	0	P1	3	33	I1	0	0
	R2	0	0	P2	2	22	I2	1	100
	R3	5	56	P3	4	44	I3	0	0
	R4	4	44	P4	0	0	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	9	100	Total	9	100	Total	1	100

Fig. K.13 Stack profile for K in week 18

Week 19

After half term and the school Inset day, the students started their music lessons again in week 19. In week 19, the music lesson focused on exploring the various sound qualities and different instrumental sounds. A TA shook a bell in front of K and K seemed to hear the bell for she made an expression of delight and smiled. K moved her head up and was awake, but she then soon drooped her head. Because K drooped her head, the TA then offered K another instrument (a shaker) and asked if she liked it. K pressed the switch and it said 'that's the one' three times (R3A, P3D). The TA put the shaker into K's left hand and held K's hand to play the shaker several times (R3A, P1B, I2B). Sometimes, K would smile and looked at the shaker but then turned her head away in another direction.

In distinguishing between a long and short sound, the teacher played a shaker making a short sound and asked K if it was a long sound. K seemed to indicate 'no'. The teacher then asked K if it was a short sound. The TA then asked K to use her switch if she thought it was a short sound. After the TA's encouragement, K pressed the switch in answering the teacher's question to say 'that's the one' twice. The teacher commented 'that's the one you want' and then K pressed the switch twice more (R3A, P3D, I2C). After the teacher had demonstrated how to play a toy maker, he tipped it upside down and it made some funny sounds. K was asked to try the instrument and the TA helped K to hold it while tipping it over to make the sounds (R3A, P1B, I2A).

In distinguishing between rough and smooth sounds, K used her switch to say 'that's the one' to indicate the sound that the teacher had played was a rough one. After the teacher's comment, K pressed the switch three more times (R3C, P3D, I2C). When the teacher reviewed the pair of sounds that they had made that day which included long and short, rough and smooth, loud and quiet and high and low ones, K vocalised towards the teacher's demonstration – along with another student's jump movement (R2B, P2A).

When the teacher assigned each student with different sound instrumental playing, K was in charge of a long rough sound and a short rough sound. K smiled and looked at the teacher – with more concentration, alert and head up. The teacher gave K a pair of scrapers and helped her to feel the rough surface on one side of the instrument. The TA helped K to hold the handle for the sound blocks and K smiled and moved her head from side to side. When the TA helped K to make sounds on the scraper, she had a big smile on her face (R3C, P1B, I2C).

In the interactive activity, everybody needed to look up at the board and watch a conductor pointing to different signs which represented different sounds. The TA helped K to play on the sound block, long and rough sounds and to follow the teacher's instruction when he pointed to their signs. Later, they did it together for four times (R3D, P1B, I2D).

Another student was appointed to be a new conductor and when he pointed to the signs, the students made the sounds. While the teacher gave instructions to the new conductor to think about a good sound to start with and a good sound to end with, K looked at the TA, who sat at her left hand side, and the TA smiled at K. The TA then held K's left hand to play the rough sounds several times when it was their turn (R3D, P1B, I2C). K had a big smile on her face. Table K.14 summarises the coding in week 19 for K:

Table K.14 The raw data table for K in week 19

		Domain Categorisation			Element Matching					
					R		P		I	
19	K138	1	1		3	A	3	D		
19	K139	1	1	1	3	A	1	B	2	B
19	K140	1	1	1	3	A	1	B	2	B
19	K141	1	1	1	3	A	3	D	2	C
19	K142	1	1	1	3	A	1	B	2	A
19	K143	1	1	1	3	C	3	D	2	C
19	K144	1	1		2	B	2	A		
19	K145	1	1	1	3	C	1	B	2	C
19	K146	1	1	1	3	D	1	B	2	D
19	K147	1	1	1	3	D	1	B	2	C
19	K148	1	1	1	3	D	1	B	2	C

The following stack profile (Fig. K.14) summarises the musical development mapping in week 19 for K. Her musical behaviours ranged from level 2 to 3 in the reactive domain, level 1 to 3 in the proactive and level 2 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 1 and the interactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
19	R1	0	0	P1	7	64	I1	0	0
	R2	1	9	P2	1	9	I2	9	100
	R3	10	91	P3	3	27	I3	0	0
	R4	0	0	P4	0	0	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	11	100	Total	11	100	Total	9	100

Fig. K.14 Stack profile for K in week 19

Week 20

When the teacher reviewed last week's lesson and demonstrated various instrumental sounds, the teacher handed a sound block for K to feel its rough surface (R2D). K then pressed her switch three times on 'that's the one' for two different instruments that were presented to her to decide which one had rough sounds (R2B, P2C, I2C).

In distinguishing between smooth or rough sounds, the teacher played an instrument and asked K's opinion. K indicated that the instrument had a smooth sound and she also had a chance to explore the smooth sound, helped by a TA. K vocalised towards the teacher and sounded like 'yeah' in answering the teacher's question. K also appeared to like the smooth sound. A TA held K's hand to produce the quiet and smooth sound (R2B, P1B, I2C). K was well aware of any changes or movements made in the classroom. Her eyes followed the teacher when he moved the white board to the front.

Later, the teacher asked K to choose what kind of sound she liked to play. K had fleeting vocalisation when the teacher wanted her to choose. Then she chose to play smooth sounds. The teacher took a chime bar for K to play. When the teacher turned around to take instruments to other students, K kept pressing her switch 'that's the one' three times (R3A, P2A, I2C). K looked at the other students and smiled. When K's head was hanging down, the TA tried to lift it and asked K to look at what was happening in the front. Then the TA held K's hand to play the chime bar – with K's head raised up and she smiled (R3A, P1B, I2D).

The teacher asked K to hold her head up to the board and K did it. The teacher then pointed to symbols on the board and then the students played their instruments accordingly. The TA held K's hand to play on the hand chime bar when it was her turn (R3A, P1B, I2D).

A new conductor was appointed and the teacher gave him a stick to point to the signs. The TA held K's hand to play the chime bar following the new conductor's pointing of signs (R3A, P1B, I2D). K was looking away or at the TA rather than looking at the conductor. She smiled from time to time. Sometimes K gave a fleeting glance at the conductor. Maybe because of her short sighted vision, she could not see the signs on the board. When the teacher appointed another student (H) to be a new conductor, a TA held K's hand to play on the hand chime bar when H pointed to the smooth sign (R3A, P1B, I2D). When the teacher appointed the third conductor, the TA helped K to play the chime bar when it was her turn. K was now alert and full of concentration. However, periodically, K was either with her head down or looking in directions other than at the front board (R3A, P1B, I2D).

The teacher recorded a song 'the sound song' on K's switch and asked K to be a helper. The sound song was: 'Sounds we hear, through the window, far and near, soft and still, high and low, loud and clear. Listen! Listen! Listen!'

(3 4 3 – | 5 4 3 1 | 5 6 5 – | 6 7 6 – | 6 6 1 – | 7 6 5 – | 5 5

| 5 5 𝅗𝅥 | 5 5 𝅗𝅥 ‖). On this call and response activity, the teacher sang the first phrase and K needed to press her switch to sing the same phrase again and it required K's concentrated listening and waiting. The teacher played the piano and sang the song when taking turns with K who pressed the switch to sing. The TA only helped K to adjust the switch and supported her arm underneath. K had a lovely smile while trying to control her own switching. She was good at taking turns with the teacher in order to perform the whole song by imitating each musical phrase and she pressed the switch in good timing. K did the switching all by herself in this task (R5A, P5A, I4D). The teacher later commented 'beautiful work, K. That was fantastic'.

Later on, the teacher and K changed positions. K was chosen to be the leader and the teacher was the 'copy cat'. K pressed the switch rather well in time with the teacher who was playing the piano (R5A, P5A, I5A). On the second time, when the TA saw K pressing the switch a bit too fast, she held K's hand and asked her to wait. In one phrase, K waited for 10 seconds before she pressed the switch. The TA would also wait and see if K's hand was 'stuck' on the switch in a certain position. She would take K's hand and place it on the tray so that K was in a better position to do the switching again. For another phrase, K waited for 5 seconds. K smiled while pressing the switch. When the song was over, she still kept pressing the switch and so the TA turned down the volume and removed the switch.

In developing the activity further, K was appointed to be the leader again and everyone in the class needed to copy K's musical phrase. K pressed the switch in taking turns with the rest of the class to sing the song. The timing of K's 'switch' was a bit delayed for about two to four seconds (R5A, P5A, I5A). K tried very hard to press the switch and she concentrated hard to control her muscles. The TA also gave gestures and verbal cues to K when it was her time to press the switch. She supported her and K waited well. K had a big smile on her face near the end of the song.

At the end of the sound song, a student was appointed to play three different instruments, 'in hiding', and the rest of the class had to guess what instrument he played. When K was being asked the question, she laughed and could not stop. So the teacher asked, 'was it a drum?' The TA said to K 'if it is yes, use your switch. If it is no, move your head'. K indicated that her answer was 'yes' by pressing the switch in the video (R3A, P2D). However, the answer was 'no'. In the same activity, K was asked what the last instrument was that she had heard and suggested that it might be the sound block. With the help of the TA, K pressed the switch and indicated it was indeed the sound block (R3A, P2A, I2C). When another member of staff took out the sound block, K laughed

with a happy smile on her face. Table K.15 summarises the coding in week 20 for K:

Table K.15 The raw data table for K in week 20

		Domain Categorisation			Element Matching					
					R		P		I	
20	K149	1			2	D				
20	K150	1	1	1	2	B	2	C	2	C
20	K151	1	1	1	2	B	1	B	2	C
20	K152	1	1	1	3	A	2	A	2	C
20	K153	1	1	1	3	A	1	B	2	D
20	K154	1	1	1	3	A	1	B	2	D
20	K155	1	1	1	3	A	1	B	2	D
20	K156	1	1	1	3	A	1	B	2	D
20	K157	1	1	1	3	A	1	B	2	D
20	K158	1	1	1	5	A	5	A	4	D
20	K159	1	1	1	5	A	5	A	5	A
20	K160	1	1	1	5	A	5	A	5	A
20	K161	1	1		3	A	2	D		
20	K162	1	1	1	3	A	2	A	2	C

The following stack profile (Fig. K.15) summarises the musical development mapping in week 20 for K. Her musical behaviours ranged from level 2 to 5 in the reactive domain, level 1 to 5 in the proactive and level 2 to 5 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 1 and the interactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
20	R1	0	0	P1	6	46	I1	0	0
	R2	3	21	P2	4	31	I2	9	75
	R3	8	57	P3	0	0	I3	0	0
	R4	0	0	P4	0	0	I4	1	8
	R5	3	21	P5	3	23	I5	2	17
	R6	0	0	P6	0	0	I6	0	0
	Total	14	100	Total	13	100	Total	12	100

Fig. K.15 Stack profile for K in week 20

Week 21

The teacher introduced a poem 'owls are calling to the fireflies, come, come' in that day's lesson. The teacher asked K to read the poem on her switch. He put K's left hand on her tray for her to have easier access to press the switch, and adjusted K's right hand to hold on to a string on her tray. K waited for 45 seconds then she activated the switch three times to read the poem (R4A, P4A, I2C). K seemed to try very hard to press the switch but had difficulty in physically carrying out the task. Because of the long waiting for the last phrase, the teacher took K's hand to press the switch in about 15 seconds. When K completed the task, she gave a good smile when everyone clapped her. In her demonstration, the teacher exaggerated the owl's sounds and K smiled and looked straight at the teacher (R3A, I2C).

On improvisation for the night time music, using the Soundbeam, K made the sounds through moving her head. On the video recording, it seemed that K understood the context and improvised on the Soundbeam to create night time music. A TA gently and slowly pushed K's wheelchair in front of the Soundbeam and K moved her head to change the sounds on the Soundbeam (R3D, P3D). After the improvisation, K gave a contained smile towards the TA. The teacher then commented 'K, that's beautiful. What a lovely sound you are making'.

The teacher placed the keyboard on K's tray and put some natural sounds on the keyboard. K was asked to press different keys to produce these natural sounds to see if she could find the right ones for night time music. The music teacher held K's left thumb to press on the keyboards and produced different kinds of sound. K tried very hard to control her muscles but could not press the keyboard by herself (R3D, P1D). Table K.16 summarises the coding in week 21 for K:

Table K.16 The raw data table for K in week 21

		Domain Categorisation			Element Matching					
					R		P		I	
21	K163	1	1	1	4	A	4	A	2	C
21	K164	1		1	3	A			2	C
21	K165	1	1		3	D	3	D		
21	K166	1	1		3	D	1	B		

The following stack profile (Fig. K.16) summarises the musical development mapping in week 21 for K. Her musical behaviours ranged from level 3 to 4 in the reactive domain, level 1 to 4 in the proactive and level 2 in the interactive domain. The modes

for the reactive domain located at level 3, the proactive domain at level 1, 3 and 4 and the interactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
21	R1	0	0	P1	1	33	I1	0	0
	R2	0	0	P2	0	0	I2	2	100
	R3	3	75	P3	1	33	I3	0	0
	R4	1	25	P4	1	33	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	4	100	Total	3	100	Total	2	100

Fig. K.16 Stack profile for K in week 21

Week 22

Week 22 was near the school summer break and was the last lesson for the academic year 2006/2007. At the beginning of the lesson, the teacher asked K about the poem they did last week and about the bird in the poem. The teacher used hand gestures when talking to K. K's head was down but later she lifted up her face and had a smile. K seemed to be aware of what was happening and she pressed the switch, and it said 'owls' (P3D).

When asked about the character of night time sounds, K thought it was low when offered two choices of high or low by the teacher and she pressed the switch to say 'that's the one' on the choice of low sounds (P3D).

The teacher recorded the triangle's sound on a switch and asked K to play the triangle, using the switch. When the teacher played the triangle, K looked up and concentrated well. Three students including K played sounds for fireflies and two other students played chime bars. Another student pressed her switch for the owl's sound to show the ending of the group performance. The whole class was divided into small groups and they used sounds to depict a scene in the poem. K pressed the switch twice to produce the triangle sounds which represented the fireflies. She waited for 11 seconds to press the switch when it was their group's turn (R3D, P3D, I3A). The music teacher explained the order for each group to come in and organised the students to do a performance. Three students produced night time sounds, firstly using their vocalisation and kept the sounds going all the time. Then fireflies joined the night time sounds and at the very end, another student was going to play the owl sounds to signify the ending. In other words,

after the groups had heard the owl sounds, they needed to stop for that was their finishing sound. When the teacher talked about the fireflies, K pressed the switch twice (R3A, P3A).

In the rehearsal, K pressed the switch by herself twice in taking turns with other students when it was their group's turn (R4A, P4A, I4A). On the second practice, K pressed the switch by herself twice (R4A, P4A, I4A) to produce the sounds for fireflies. On the third practice, without the teacher's instruction, K pressed the switch by herself well in taking turns with other groups (R4A, P4A, I4B) and she looked up at the teacher. The teacher commented 'you know something, you are absolutely fantastic without technology'. Everyone clapped themselves for their own performance. On the fourth practice, the teacher asked a student to be the leader. A TA took the switch to touch K's hand rather than wait for her to do it by herself and then K pressed the switch by herself once (R4A, P4A, I4B).

On keyboard improvisation, K smiled and pressed the keyboard by herself using the right hand. Then she used her left hand to press the keyboard as well. She was very excited about the sounds she made and gave a knowing smile. The researcher thought she did the improvisation very well on the theme night time music. She did it independently and was engaged in music making all the way through. The music itself had a clear beginning and ending, with loud and soft sounds, different durations of notes and good changes in the musical elements as well (R5A, P5B). The teacher commented 'I like you keeping on changing your sounds all the time. Thank you, K, really nice. Beautiful work'.

In music listening time, the teacher played a song in the lesson. A TA used her hand as a switch and asked K if she liked the music. K attempted to use her left hand to touch the TA's hand and the TA interpreted K's action as confirming that she did indeed like it (R5A). Table K.17 summarises the coding in week 22 for K:

Table K.17 The raw data table for K in week 22

		Domain Categorisation			Element Matching					
					R		P		I	
22	K167		1				3	D		
22	K168		1				3	D		
22	K169	1	1	1	3	D	3	D	3	A
22	K170	1	1		3	A	3	A		
22	K171	1	1	1	4	A	4	A	4	A
22	K172	1	1	1	4	A	4	A	4	A
22	K173	1	1	1	4	A	4	A	4	B
22	K174	1	1	1	4	A	4	A	4	B
22	K175	1	1		5	A	5	B		
22	K176	1			5	A				

The following stack profile (Fig. K.17) summarises the musical development mapping in week 22 for K. Her musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 4 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 3 and 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
22	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	2	25	P3	4	44	I3	1	20
	R4	4	50	P4	4	44	I4	4	80
	R5	2	25	P5	1	11	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	8	100	Total	9	100	Total	5	100

Fig. K.17 Stack profile for K in week 22

Musical behaviours and development of K in term three (the school autumn term): weeks 24 to 38

Week 27

After the school summer break, this was K's first music lesson in the school autumn term of the new academic year 2007/2008. When the teacher sang the 'hello song' to K, K pressed the switch to sing 'my name is K' without any help at all, and K only waited a

few seconds to press the switch (R5A, P5A, I4D).

In this week, the teacher introduced a new song and the song went like this: "K, you see nobody pass here? No, my friend. K, you see nobody pass here? No, my friend. Well, one of my biscuits gone, don't tell me so, one of my biscuits gone" (5 5 5 5555 6 5 · | 3 · 2 1 – | 5 5 55555 6 5 · | 3 · 2 1 5 | 3 3 3 2 2 1 5 5 6 5 | 3 3 3 2 2 1 – ‖). "K, you see nobody pass here? No, my friend. K, you see nobody pass here? No, my friend. Well, two of my biscuits gone, don't tell me so, two of my biscuits, one of my biscuits gone" (5 5 5 5555 6 5 · | 3 · 2 1 – | 5 5 5 5555 6 5 · | 3 · 2 1 5 | 3 3 3 2 2 1 5 5 6 5 | 3 3 3 2 2 | 3 3 3 2 2 1 – ‖). The teacher then added to the biscuits' number each time. K's name was used in demonstration of introducing this new song in the group. K smiled during the teacher's song (R4A).

Later, the teacher recorded the singing in a high-pitched female's voice, and K smiled. In taking turns with the music teacher, K pressed the switch after 5 seconds, which sang "no, my friend" (3 · 2 1 –) roughly on time. In her second response "no, my friend" (3 · 2 1 –), K pressed the switch when the teacher was still singing his phrase. Therefore, the teacher took K's hand aside. On her third response "don't tell me so" (5 5 6 5), K pressed the switch at the correct time (R4A, P4B, I4B). After the song had finished, the teacher unplugged the switch. K laughed while listening to the teacher's comment.

In distinguishing the sounds from different instruments, the teacher played the tambourine and asked K what instrument had she just heard. K vocalised excitingly while hearing the teacher playing the tambourine. K pressed the switch and it recorded "tambourine". Then she gave a broad grin (R4A, P3D). In developing the same activity, the teacher played three different instruments at the same time and then took away one instrument at a time. K and H were asked to work together and they told each other which instruments they thought had stopped first and second. K smiled and had eye contact with both H and the teacher. A TA asked K what she thought, and then the TA

told the teacher that K thought the drum had stopped first (R3C). Table K.18 summarises the coding in week 27 for K:

Table K.18 The raw data table for K in week 27

		Domain Categorisation			Element Matching					
					R		P		I	
27	K177	1	1	1	5	A	5	A	4	D
27	K178	1			4	A				
27	K179	1	1	1	4	A	4	B	4	B
27	K180	1	1		4	A	3	D		
27	K181	1			3	C				

The following stack profile (Fig. K.18) summarises the musical development mapping in week 27 for K. Her musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 4 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 3, 4 and 5 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
27	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	1	20	P3	1	33	I3	0	0
	R4	3	60	P4	1	33	I4	2	100
	R5	1	20	P5	1	33	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	5	100	Total	3	100	Total	2	100

Fig. K.18 Stack profile for K in week 27

Week 28

Then the teacher sang the 'hello song' with K when it was her turn, K pressed the switch in good timing to fit in with the teacher's singing (R5A, P5A, I4D).

In practising last week's song, K was invited to be the teacher's helper. When the teacher recorded K's part, in a high pitched woman's voice, the students were laughing and K looked at the teacher intently. In taking turns with the teacher, K switched in good timing on her part 'no, my friend' (3 · 2 1 −) and 'don't tell me so' (5 5 6 5).

At times, maybe she was too enthusiastic for she tended to keep pressing the switch. Therefore, the teacher blocked K's hand from the switch when it was not her turn and then the switch was turned off when K had finished her turn (R5A, P5A, I4D). On the second practice, the teacher reminded K to wait patiently and she did not seem to block the switch from K when it was not her turn. K also waited well until her turn with the teacher (R5A, P5A, I4D).

In the same interactive song, the teacher sang the song and when it was the students' turn. They needed to tap their rhythmic patterns on 'no, my friend' (♩ . ♪ 𝅗𝅥) and 'don't tell me so' (♪ ♪ ♪ 𝅗𝅥). The teacher recorded the rhythmic patterns by tapping K's tray for her response on the switch. K seemed to be very keen on pressing the switch and she often pressed the switch before the teacher had finished his singing in their turn taking activity (R4B, P4B, I4B). Sometimes, K's waiting time fluctuated and the teacher suggested they tried it again and reminded K to wait her turn. On the second practice, two TAs physically blocked K's hand from the switch when it was not her turn and let her press the switch when it was her turn. She did it well with good timing (R4B, P4B, I4B).

The teacher recorded the same song on the piano and asked different students to use their switches to sing the melody of the songs in turn. It sounded like instrumental dialogue when the teacher recorded the piano melodic part on their switches. Different students played their parts by taking turns with a student who played the rondo 'theme A'. Some other students also used drums or guitar as their response. K answered by pressing the switch recorded on the piano of the melody (3 3 3 4 4 2 2 3) to respond. When the teacher explained the order of the song that a student was a rondo theme A on melody (5 5 5 5555 6 5 ·), the next student pressed his switch on piano melody (3 · 2 1 –), and the theme A again and then another student played a drum in response. Theme A appeared again and then another student played the guitar and then theme A and the other student played another drum. Then theme A appeared again and K pressed her switch on the piano melody (3 3 3 4 4 2 2 3), and then theme A appeared again and a student played a drum to finish the song.

K looked at the teacher and smiled. She seemed to press the switch several times but the switch was not connected to the other switch which could produce the sound. However,

when the teacher called out K's name, K did well in taking turns and in good timing with the student who played theme A while pressing the switch (R4A, P4A, I4B).

On the second practice for the interactive activity, K pressed the switch in time (R4B, P4A, I4D). Later, K seemed to keep pressing the switch when it was not her turn and a TA switched off the sound and told K it was another student's turn. On the third practice, the teacher asked all the students to move into a circle and indicated that he was not going to give any instruction for the activity. K was head down and when it was K's turn, a TA held K's hand to press the switch without waiting for her to do it by herself (R2A, P1B).

The teacher divided the students into groups of two and practised the same activity again. A new leader from the students was appointed to be the rondo theme A. K and H were in the same group and in all there were three groups of pairs. K pressed the switch by herself in good timing with H when taking turns with other students (R5A, P5A, I5A).

In the music listening, the teacher played three pieces of music on the CD player and asked the students to distinguish between which one was the oldest and which one was the youngest. A TA was working with K and she asked K to use her switch to make her choice. K pressed the switch twice to make her decision indicating that the first one was the youngest (a pop song) and the last one was the oldest (a classical piece) (R4A, P3D). Table K.19 summarises the coding in week 28 for K:

Table K.19 The raw data table for K in week 28

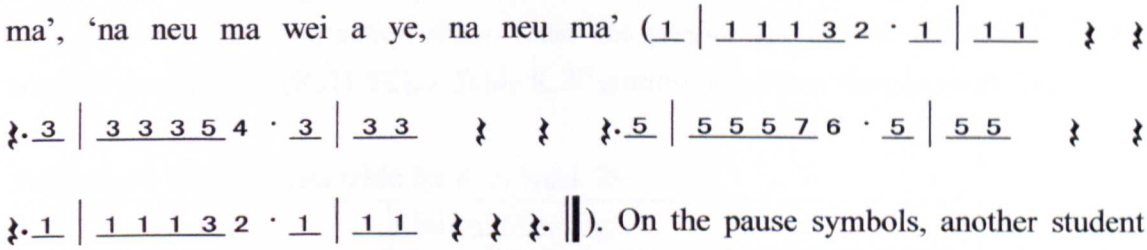
		Domain Categorisation			Element Matching					
					R		P		I	
28	K182	1	1	1	5	A	5	A	4	D
28	K183	1	1	1	5	A	5	A	4	D
28	K184	1	1	1	5	A	5	A	4	D
28	K185	1	1	1	4	B	4	B	4	B
28	K186	1	1	1	4	B	4	B	4	B
28	K187	1	1	1	4	A	4	A	4	B
28	K188	1	1	1	4	B	4	A	4	D
28	K189	1	1		2	A	1	B		
28	K190	1	1		2	A	1	B		
28	K191	1	1	1	5	A	5	A	5	A
28	K192	1	1		4	A	3	D		

The following stack profile (Fig. K.19) summarises the musical development mapping in week 28 for K. Her musical behaviours ranged from level 2 to 5 in the reactive domain, level 1 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and 5 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
28	R1	0	0	P1	2	18	I1	0	0
	R2	2	18	P2	0	0	I2	0	0
	R3	0	0	P3	1	9	I3	0	0
	R4	5	45	P4	4	36	I4	7	88
	R5	4	36	P5	4	36	I5	1	13
	R6	0	0	P6	0	0	I6	0	0
	Total	11	100	Total	11	100	Total	8	100

Fig. K.19 Stack profile for K in week 28

Week 29

Week 29 was the week before the school half term. The teacher introduced a new song for the students to take turns in performing their part. The song went like this: 'Na neu ma wei a ye, na neu ma', 'na neu ma wei a ye, na neu ma', 'na neu ma wei a ye, na neu ma', 'na neu ma wei a ye, na neu ma' (). On the pause symbols, another student needed to clap () two quavers and one crochet rhythm to go with the singing. The teacher recorded a high pitched woman's voice into K's switch, and she smiled. K also smiled when the teacher called her name. K pressed the switch but the switch had a problem and it seemed to be broken. So the teacher recorded the singing again and K vocalised and laughed along with the teacher's singing (R4A, P4A).

On their second practice, K waited for about 25 seconds before she pressed the switch and this may have been due to the fact that she was too busy laughing. By herself, while taking turns with another student for the rest of the part, K used her switch, with very

good timing (R5A, P5A, I5A). The teacher then commented 'Absolutely fantastic. K, what a brilliant switching. That was really good'.

Later, the teacher recorded this African song on a switch in one go and he asked K to sing the song by using her switch, and the teacher sang a second part to form a canon. K pressed the switch to start off the song and when it had finished, she started to press the switch again to sing it a second time. She participated in the activity with good timing when pressing the switch. After K had pressed the switch of the song, a TA took K's hand away to the side of the tray so that she could press the switch by herself (R5A, P5A, I5A).

The teacher told the class a story about an African animal fable concerning a magnificent tree called 'Wangalema'. The original teaching material involved the audience with dance, movement, rhyme, and Tanzanian drumming rhythms. Using a modified version, the music teacher told the story in front of the class and later role-played some of the scenes in the story. The teacher recorded the name of the tree on K's switch. Then the teacher asked K what was the name of the tree and K waited about 20 seconds before she pressed the switch (R4D, P4A, I4B). Later as the story went along, the teacher asked the same question and K waited about 8 seconds before she pressed the switch to produce the saying which fitted into the teacher's story telling (R4D, P4A, I4B).

The teacher also arranged role-play for one of the scenes in the story and K showed an interest in watching the action show. Later she pressed the switch and called out the name 'a wangalema' (R3D, P3D). Table K.20 summarises the coding in week 29 for K:

Table K.20 The raw data table for K in week 29

		Domain Categorisation			Element Matching					
					R		P		I	
29	K193	1	1		4	A	4	A		
29	K194	1	1	1	5	A	5	A	5	A
29	K195	1	1	1	5	A	5	A	5	A
29	K196	1	1	1	4	D	4	A	4	B
29	K197	1	1	1	4	D	4	A	4	B
29	K198	1	1	1	4	D	4	A	4	B
29	K199	1	1	1	4	D	4	A	4	B
29	K200	1	1		3	D	3	D		

The following stack profile (Fig. K.20) summarises the musical development mapping in week 29 for K. Her musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
29	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	1	13	P3	1	13	I3	0	0
	R4	5	63	P4	5	63	I4	4	67
	R5	2	25	P5	2	25	I5	2	33
	R6	0	0	P6	0	0	I6	0	0
	Total	8	100	Total	8	100	Total	6	100

Fig. K.20 Stack profile for K in week 29

Week 30

After half term, the students came back to the school in week 30. The teacher sang the 'hello song' with K and K giggled. She waited for about 15 seconds before pressing the switch to sing 'my name is K' (R4B, P4A, I4D). After the singing, she pressed the switch again and the teacher asked a TA to switch it off (R3A, P3A, I2B). Table K.21 summarises the coding in week 30 for K:

Table K.21 The raw data table for K in week 30

		Domain Categorisation			Element Matching					
					R		P		I	
30	K201	1	1	1	4	B	4	A	4	D
30	K202	1	1	1	3	A	3	A	2	B

The following stack profile (Fig. K.21) summarises the musical development mapping in week 30 for K. Her musical behaviours ranged from level 3 to 4 in the reactive domain, level 3 to 4 in the proactive and level 2 to 4 in the interactive domain. The modes for the reactive domain located at level 3 and 4, the proactive domain at level 3 and 4 and the interactive domain at level 2 and 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
30	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	1	50
	R3	1	50	P3	1	50	I3	0	0
	R4	1	50	P4	1	50	I4	1	50
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	2	100	Total	2	100	Total	2	100

Fig. K.21 Stack profile for K in week 30

Week 34

In preparing the end-term musical performance, the class was encouraged to think about what the people were selling at the market first. The teacher touched K's hand and said that they were selling special ink to make a pattern of your hand. K's head was down, but she looked at her hand when the teacher touched it (R2A, I2C). K had a social script recorded on her switch. The teacher had a conversation with K on her switch. Here is the gist of what was said:

K: hello. Do you like my hand?

T: it's beautiful. It has beautiful patterns.

K: I did it last weekend.

T: was it a special weekend for you?

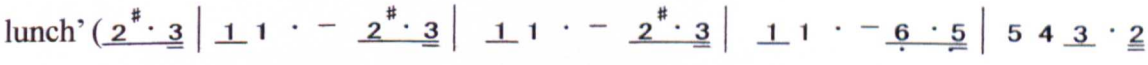
K: 'how was your weekend?'

T: My weekend was very stressful. It was very stressful.

K: 'talk to you later' (R5A, P4B, I4B).

In the role-play of the story 'Jack and the Beanstalk', K was being Jack's mom and the teacher recorded a social script on her switch. At first, K waited for about 16 seconds before pressing the switch and it seemed that the switch had some problems. Then K pressed the switch in good timing in dialogue with another student who was being Jack (R5A, P4B, I4B).

The song that the class was preparing to sing at the end-term musical performance was called 'crunch'. The lyric and melody were: 'Oh the giant has a honker and it's shiny like a great big conker. If the giant gets a whiff of you, then crunch you are the giant's



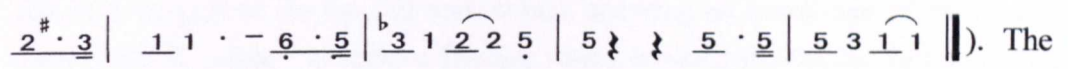
). The music teacher recorded the singing on K's switch and asked K to sing the song. The rest of the class copied her switch singing after each musical phrase. K pressed the switch with a delayed response of about 5 to 10 seconds before she pressed the next musical phrase (R4B, P4B, I4A). When the teacher played the song on the CD again and asked the students to listen to it, K vocalised towards the end of the song in an excited voice (R5A, P2B). Table K.22 summarises the coding in week 34 for K:

Table K.22 The raw data table for K in week 34

		Domain Categorisation			Element Matching					
					R		P		I	
34	K203	1	1	1	5	A	4	B	4	B
34	K204	1		1	2	A			2	C
34	K205	1	1	1	5	A	4	B	4	B
34	K206	1	1	1	4	B	4	B	4	A
34	K207	1	1		5	A	2	B		

The following stack profile (Fig. K.22) summarises the musical development mapping in week 34 for K. Her musical behaviours ranged from level 2 to 5 in the reactive domain, level 2 to 4 in the proactive and level 2 to 4 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
34	R1	0	0	P1	0	0	I1	0	0
	R2	1	20	P2	1	25	I2	1	25
	R3	0	0	P3	0	0	I3	0	0
	R4	1	20	P4	3	75	I4	3	75
	R5	3	60	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	5	100	Total	4	100	Total	4	100

Fig. K.22 Stack profile for K in week 34

Week 35

When the teacher sang the 'hello song' with K, the teacher wanted K to use her voice and make some sounds as a signal of singing 'hello' back. K appeared to be shy but she

did look straight at the teacher and smiled, showing an awareness of the familiar song. At the end, K seemed to make a fleeting sound towards the teacher but it was very quiet (R4A, P2C, I2C).

The end-term musical performance song for this class had three parts. The first part contained singing which would be played through the CD player. The second part was the song 'crunch' in which all the students would sing the song and do actions according to the lyrics. The third part was a rhyme by two students taking turns.

K and another student had a practice on the third part. K took turns very well with the student on the pre-recorded script. The teacher blocked K's hand from the switch when it was the other student's turn. However, when it was K's turn, she did it in good timing with no delay (R4A, P4A, I4D). On the second practice when the teacher did not block K's hand from the switch when it was not her turn, she did not wait properly and left no space for the other student to finish her sentence. Later on when someone talked to K's TA, K lost her concentration and delayed a while before she pressed the switch (R3A, P3A, I2C).

On their third practice, the teacher started with the backing music and K and the other student were asked to go straight into their part. The timing of K's switching fluctuated. Sometimes she was on time but sometimes her hand flung out of her tray and it took time for her to get it back to press the switch. After each time K had pressed the switch, a TA tried hard to stop K from pressing her switch again so that other students could have a chance to finish their sentences first (R3A, P3C, I2C).

On the keyboard improvisation to play a scene that depicts Jack climbing the Beanstalk, K was fully prompted by the teacher to play from the low key and climbing higher to high notes (R4A, P1B, I2C). Table K.23 summarises the coding in week 35 for K:

Table K.23 The raw data table for K in week 35

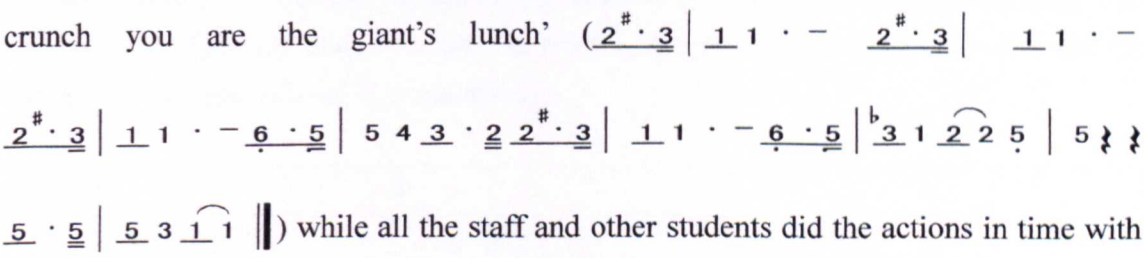
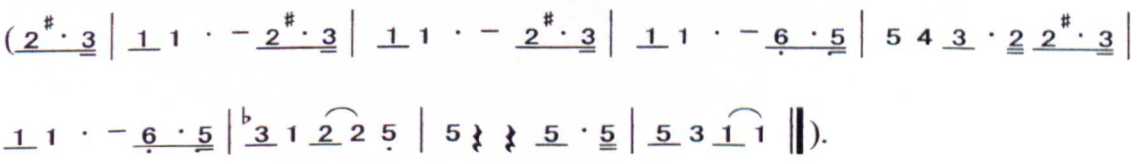
		Domain Categorisation			Element Matching					
					R		P		I	
35	K208	1	1	1	4	A	2	C	2	C
35	K209	1	1	1	4	A	4	A	4	D
35	K210	1	1	1	3	A	3	A	2	C
35	K211	1	1	1	3	A	3	C	2	C
35	K212	1	1	1	4	A	1	B	2	C

The following stack profile (Fig. K.23) summarises the musical development mapping in week 35 for K. Her musical behaviours ranged from level 3 to 4 in the reactive domain, level 1 to 4 in the proactive and level 2 to 4 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 3 and the interactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
35	R1	0	0	P1	1	20	I1	0	0
	R2	0	0	P2	1	20	I2	4	80
	R3	2	40	P3	2	40	I3	0	0
	R4	3	60	P4	1	20	I4	1	20
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	5	100	Total	5	100	Total	5	100

Fig. K.23 Stack profile for K in week 35

Week 36

In preparation for the end-term musical show, the teacher recorded the first part of the song 'crunch' slowly on to K's switch. K waited for a few seconds before pressing the switch once after her TA adjusted it for her. The switch sang the lyrics 'oh the giant has a honker and it's shiny like a great big conker. If the giant gets a whiff of you, then crunch you are the giant's lunch' () while all the staff and other students did the actions in time with the singing (R4A, P4A, I4C). Later on, it was K's turn again to sing the first part of the song 'crunch'. With no hesitation, K pressed the switch to sing it and she was clear about her instructions. She smiled when seeing other people doing those actions (R4D, P4B, I4C). Then it was another student's turn to sing the second part of the song 'crunch' on his switch, about the lyrics 'oh the giant has a hooter, and it's bigger, like a great big scooter. If the giant has a whiff of you, then whack, you're the giant's snack' ().

The students went through the rehearsal once and when it was K's turn, K looked from side to side and laughed. After a TA had put K's hand in her tray, she switched it after 25 seconds to sing her first part in the 'crunch' song (R4D, P4B, I4C). When it was another person's turn to sing the second part of the 'crunch' song, K showed great interest while watching the staff and other students doing the actions to the lyrics.

Later on, when it was K's turn on the performance rehearsal, K pressed the switch in time and without any additional prompting (R5B, P5A, I5A). She smiled and she seemed to be well involved in the rehearsal. Table K.24 summarises the coding in week 36 for K:

Table K.24 The raw data table for K in week 36

		Domain Categorisation			Element Matching					
					R		P		I	
36	K213	1	1	1	4	A	4	A	4	C
36	K214	1	1	1	4	D	4	B	4	C
36	K215	1	1	1	4	D	4	B	4	C
36	K216	1	1	1	5	B	5	A	5	A

The following stack profile (Fig. K.24) summarises the musical development mapping in week 36 for K. Her musical behaviours ranged from level 4 to 5 in the reactive domain, level 4 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
36	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	0	0	I3	0	0
	R4	3	75	P4	3	75	I4	3	75
	R5	1	25	P5	1	25	I5	1	25
	R6	0	0	P6	0	0	I6	0	0
	Total	4	100	Total	4	100	Total	4	100

Fig. K.24 Stack profile for K in week 36

Week 37

In the dress rehearsal, K pressed the switch well in time to sing the first part of the song 'crunch' (R4A, P4A, I4D) and the singing was pre-recorded in the music lesson. However, her head was down and a TA held her hand and placed it on her tray. Table K.25 summarises the coding in week 37 for K:

Table K.25 The raw data table for K in week 37

		Domain Categorisation			Element Matching					
					R		P		I	
37	K217	1	1	1	4	A	4	A	4	D

The following stack profile (Fig. K.25) summarises the musical development mapping in week 37 for K. Her musical behaviours ranged from level 4 in the reactive domain, level 4 in the proactive and level 4 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
37	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	0	0	I3	0	0
	R4	1	100	P4	1	100	I4	1	100
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	1	100	Total	1	100	Total	1	100

Fig. K.25 Stack profile for K in week 37

Week 38

Week 38 was near the school Christmas break and was near the end of the researcher's fieldwork observations. On the performance day, K seemed to be awake and looked around the school hall. When it was K's turn to press the switch to sing the first part of the song 'crunch', K waited for about 8 seconds then pressed the switch to sing the song (R4A, P4A, I4D). A TA took her hand and placed it on her tray. When it was another student's turn to sing the second part of the song 'crunch', K got very excited and vocalised loudly at the end of the song (5A, 2C, 2C) on the stage. Table K.26 summarises the coding in week 38 for K:

Table K.26 The raw data table for K in week 38

		Domain Categorisation			Element Matching					
					R		P		I	
38	K218	1	1	1	4	A	4	A	4	D
38	K219	1	1	1	5	A	2	C	2	C

The following stack profile (Fig. K.26) summarises the musical development mapping in week 38 for K. Her musical behaviours ranged from level 4 to 5 in the reactive domain, level 2 to 4 in the proactive and level 2 to 4 in the interactive domain. The modes for the reactive domain located at level 4 and 5, the proactive domain at level 2 and 4 and the interactive domain at level 2 and 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
38	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	1	50	I2	1	50
	R3	0	0	P3	0	0	I3	0	0
	R4	1	50	P4	1	50	I4	1	50
	R5	1	50	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	2	100	Total	2	100	Total	2	100

Fig. K.26 Stack profile for K in week 38

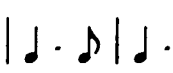
Appendix L

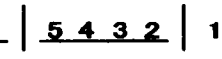
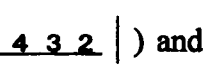
Weekly coding, comments and analyses for the musical behaviours and development of H

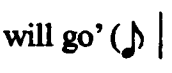
Musical behaviours and development of H in term one (the school spring term): weeks 1 to 13

Week 2

Week 2 was near the end of the school Christmas term in December 2006. In that day's lesson, a student was asked to press his switch to sing the 'hello song' to greet everyone in the class. H seemed responsive to say 'hello' back to the students but his voice was very quiet and difficult to hear in the audio tape (R2A, P2C, I2C).

Two professional musicians, a violinist and a double bass player, visited the music class that day. They played background music to support the students' musical activities. In a musical activity, the teacher whispered into H's ear 'Heigh ho, Heigh ho, a hunting we will go' in the rhythmic pattern () and wanted H to say the words with him. However, it was very difficult to hear H's voice due to his medical condition, verbal ability, and the way he controlled his sounds (R2C, P2A, I2C).

When the teacher assigned each student a rhymed musical phrase, H pointed to a guitar and wanted his part to be involved with one. Then the music teacher asked him the question, 'is it a guitar?' and H answered 'yeah' in a very quiet voice (R2C, P2C). The teacher produced a rhymed musical phrase for H 'we will find a guitar and put it in the car' (). When it was H's turn to sing his phrase in the group activity, the teacher sang 'we will find a guitar, and put it in the' () and H responded very softly with the word 'car' following the teacher's singing along with other students (R4D, P4D, I4D). The two musicians accompanied the students' singing by providing a regular beat for them.

In explaining the structure of the song, the teacher said that the first part of the song was 'Heigh ho, Heigh ho, a hunting we will go' () in chanting. The second part was 'we will find, we will find, we will find, we will find'

(5 5 5 5 5 5 | 5 5 5 5 5 5) in singing. The third part was for each student to take turns in singing their phrase in rhyme. The whole song was accompanied by a double bass and a violin to give an uplifting rhythm and beat. In order to help H when it was his turn to sing the musical phrase, the teacher sang two phrases 'we will find a' (5 5 5 5 |) and 'and put it in the' (6 | 5 4 3 2 |) while waiting for H to fill in the gap. H said the words 'guitar' and 'car' followed by the teacher's singing it twice. His response was much delayed. When H said guitar, it was audible but 'car' was very soft indeed (R4D, P4C, I4D).

On the third practice, the teacher sang 'we will find the guitar and put it in the' (5 5 5 5 | 5 · 6 | 5 4 3 2 |) and H said the word 'car' quietly when it was his turn in taking turns with the teacher and other students (R4D, P4D, I4D). The musicians played an accompaniment part throughout the musical activity.

A West African children's song called 'Che che kule' was being reviewed in the lesson. The song went like this: Che che kule (5 5 4 5), Che che kofisa (5 5 4 6 5), Kofisa langa (4 6 4 5 5), Langa chi langa (4 4 6 5 5), com a dande (i · 6 5 6). A student was appointed to be the leader and invited a call and response from the rest of the group. H seemed to partially join in the group singing and imitated some of the syllables (R3C, P3C, I3C).

Before break time, the violinist demonstrated her violin to the students and said 'string' and 'bow' before they performed two pieces for the students. H imitated and said 'yeah, yeah, bow' (P3D, I3C). After their performance, the musicians congratulated them and said 'thank you for such good singing...lovely singing, all of you'. Table L.1 summarises the coding in week 2 for H:

Table L.1 The raw data table for H in week 2

		Domain Categorisation			Element Matching					
					R		P		I	
2	H001	1	1	1	2	A	2	C	2	C
2	H002	1	1	1	2	C	2	A	2	C
2	H003	1	1		2	C	2	C		
2	H004	1	1	1	4	D	4	D	4	D
2	H005	1	1	1	4	D	4	C	4	D
2	H006	1	1	1	4	D	4	D	4	D
2	H007	1	1	1	3	C	3	C	3	C
2	H008		1	1			3	D	3	C

The following stack profile (Fig. L.1) summarises the musical development mapping in week 2 for H. His musical behaviours ranged from level 2 to 4 in the reactive, proactive and interactive domains. The modes for the reactive and proactive domains were located at level 2 and 4 and the interactive domain at level 4, respectively.

Fig. L.1 Stack profile for H in week 2

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
2	R1	0	0	P1	0	0	I1	0	0
	R2	3	43	P2	3	38	I2	2	29
	R3	1	14	P3	2	25	I3	2	29
	R4	3	43	P4	3	38	I4	3	43
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	7	100	Total	8	100	Total	7	100

Week 3

After the Christmas break, the students came back to the school in week 3. This was the beginning of the school's spring term in January 2007. The music teacher asked H to help him to sing the song 'bells in the steeple' and the lyric and music was 'bells in the steeple how sweetly they ring. This is the holiday, ding ding dong ding' (1 1 1 | 3 3 3 | 5 5 5 | 3 – – | 1 3 5 | 1 3 5 | 1 3 5 | 1 – – ‖). In the first practice, H sang very quietly with the teacher and it was difficult to hear him. In the second practice, H imitated some of the last words of every musical phrase when the teacher left a gap for him to sing. For example, the teacher sang 'bells in the steeple' (1 1 1 | 3 3) and H sang 'Bell in'. The teacher sang 'how sweetly they ring'

(3 | 5 5 5 | 3 – – |) and H sang 'ring, ye'. The teacher sang 'this is the holiday' (1 3 5 | 1 3 5 |) and H sang simultaneously with the teacher 'hol (iday)'. The teacher sang 'ding ding dong ding' (1 3 5 | 1 – – ‖). H sang simultaneously with the teacher on the note 'ding' (R5A, P5A, I4D). The teacher later commented by saying 'you have been practising, H. That sounds so fantastic'.

When they did the same task again, H's singing was quiet and soft and was almost inaudible. The teacher sang 'bells in the steeple how sweetly they ring' (1 1 1 | 3 3 3 | 5 5 5 | 3 – – |) and H sang 'ring'. The teacher then sang 'this is the holiday' (1 3 5 | 1 3 5 |) and H sang 'hol (iday)' with the teacher at the same time. Then the teacher sang 'ding ding dong ding' and H sang simultaneously with the teacher on 'dong ding' (R5A, P5A, I4D).

When the teacher asked H how many lines there were in the song he gave him two choices – two lines or five lines, H imitated the last words spoken by the teacher and said 'five lines'. This might be due to H's tendency to repeat the last words uttered by the teacher but not knowing what they meant (P3D, I3A).

When the teacher asked for a helper in the class, H often was very keen at volunteering and spoke in a loud voice 'me' in the classroom, which was quite opposite to his singing. H was wheeled in front of the class to do the task with the teacher. The teacher sang: 'low low low, middle middle middle, high high high, middle, low middle high, low middle high, low middle high, low (1 1 1 | 3 3 3 | 5 5 5 | 3 – – | 1 3 5 | 1 3 5 | 1 3 5 | 1 – –) while moving his hand up and down in the air. H imitated the teacher's actions by moving his hand up and down as well (R3D, P3C, I3C).

H used an electric wheelchair in the class and he wheeled himself to the front of the class to do the task that was set for him. The teacher gave H three switches and each switch had notes on 'dol', 'mi' and 'sol' individually. The teacher pointed to the switch and asked H to press the switch to sing the song 'bells in the steeple'. H pressed the switch on the teacher's instruction quite well. He pressed the different switches to sing

1 1 1 | 3 3 3 | 5 5 5 | 3 – – | 1 3 5 | 1 3 5 | 1 3 5 | 1 – – ‖

followed by the teacher's pointing but with a bit delay on his switching (R3C, P3C, I3C).

On their next practice, the teacher only gave a verbal instruction rather than pointing to the switches for H. This time H pressed the switch all by himself. He still needed the teacher's help in singing the notes from time to time but, on the second phrase, H did the task by himself in the correct order and speeded up his actions (R4B, P4B, I4A). The teacher commented 'really fast now. H, very very good work'.

The teacher asked the students to close their eyes while he played the melody of the song 'bells in the steeple' on the metallophone. Then the teacher asked if anyone knew the song and H was eager to answer and raised his hand to show that he did (R4A, P3D, I3C). However, H found it difficult to articulate the answer and the teacher prompted his answer for him. Later, H seemed to join in the group singing to sing the song again, but it was difficult to tell how much he really did sing.

When the teacher sang a canon with another student on the switch, he asked the students to distinguish between the two voices – whether they started together or whether the teacher's singing entered later. In response, H said 'yeah' to indicate that he had noticed the canon. However, there was no clear evidence showing that he understood the structural features of the song (R3C, P3D). Table L.2 summarises the coding in week 3 for H:

Table L.2 The raw data table for H in week 3

		Domain Categorisation			Element Matching					
					R		P		I	
3	H009	1	1	1	5	A	5	A	4	D
3	H010	1	1	1	5	A	5	A	4	D
3	H011		1	1			3	D	3	A
3	H012	1	1	1	3	D	3	C	3	C
3	H013	1	1	1	3	C	3	C	3	C
3	H014	1	1	1	4	B	4	B	4	A
3	H015	1	1	1	4	A	3	D	3	C
3	H016	1	1		3	C	3	D		

The following stack profile (Fig. L.2) summarises the musical development mapping in week 3 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 4 in the interactive domain. The modes for the

reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 3, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
3	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	3	43	P3	5	63	I3	4	57
	R4	2	29	P4	1	13	I4	3	43
	R5	2	29	P5	2	25	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	7	100	Total	8	100	Total	7	100

Fig. L.2 Stack profile for H in week 3

Week 4

The teacher greeted everyone in the class with the 'hello song' and H twice said 'hello' back to the teacher's singing in a rather soft and quiet sound (R3C, P3D, I3C). In the turn taking activity, the teacher wanted H to copy after each musical phrase for the song 'bells in the steeple'. The teacher sang 'bells in the steeple' (1 1 1 | 3 3) and H sang '(stee) ple'. The teacher sang 'how sweetly they ring' (3 | 5 5 5 | 3 – – |) and H sang 'ring, mmm'. The teacher sang 'this is a holiday' (1 3 5 | 1 3 5 |) and H sang 'day'. Then the teacher sang 'ding ding dong ding' (1 3 5 | 1 – – ‖) and H sang 'ding'. H tried to imitate the last word of every phrase he heard from the teacher in singing the song. His singing was a little hesitant (R3C, P3C, I3C). However, even though his singing was quiet, it was just audible.

In the leader and copycat activity, H was the leader to press the switch to sing the musical phrase and the teacher copied the switch's singing. H pressed the switch well and with good waiting, after the teacher had finished copying his singing in the first phrase. H also pressed the switch for the second phrase in time (R5A, P4C, I4D).

In considering the pause of the song 'bells in the steeple', the teacher demonstrated pauses of two and pauses of three through clapping and chanting. After the teacher sang the song again and tapped the pause ('clap tap tap' for the pauses of three), he offered H two choices on the song – for pause two or pause three. H indicated that the pause was 'three' and he got the answer right. It was not clear if he understood the concept or

whether he had just repeated the last choice that was suggested by the teacher (R5B).

On the task of tapping and clapping the pauses of three, H imitated the teacher's actions on 'clap tap tap' while the teacher chanted 'one two three' repeatedly. From the teacher and a TA's comment, H seemed to do the task by himself without any help and copied the teacher's action in tapping and clapping in the pause of three, independently (R4B, P4A, I3C).

In conducting and singing the song 'bells in the steeple' as a group, it was hard to hear H's singing in the group practice but he seemed to join in conducting twice following the teacher's hand movement (R3B, P3B, I3A). The teacher commented to the whole class that 'you should give yourself a big clap. That was really fantastic conducting. I am particularly impressed with you. You did it all by yourselves'.

In playing the pause on different instruments for the song 'bells in the steeple', H copied the teacher by saying the word 'drum' when the teacher picked up a drum (P3A, I3A). The teacher demonstrated the pause of three by playing on the drum for one, and making a cymbal crash for two and three. The students were asked to count and then conduct with the teacher. When the teacher asked H to say 'umm cha cha' to substitute the counting, H followed the teacher's chanting on 'umm cha cha' but without any sense of timing of the pause of three (R3D, P3C, I3A).

In group activity, H seemed to join in the chanting 'umm cha cha' with other students. When a student made the pause on the drum and cymbal, the whole class was asked to sing the song 'bells in the steeple'. H seemed to join in with a few words (R3B, P3B, I3C). However, it was difficult to tell how much he sang within the group context because his voice was so often overshadowed by other people's singing.

The teacher asked H and K to take turns on 'umm cha cha' that H played the 'umm' and K played 'cha cha' on the drum and cymbal. H beat the drum by himself without any help. However, he needed the teacher's verbal reminder of when his turn was to beat the drum after K had finished her part (R4D, P4B, I4D).

In the decision making of their favourite song in the music listening time, H indicated with no difficulty that he liked the first piece which was classical music that was being played (R5A). When the teacher gave a possible explanation for the reason that H liked it was because the quality of the music was quiet and calm, H said 'yeah' and nodded approval to the answer that the teacher provided (P3D). Table L.3 summarises the coding in week 4 for H:

Table L.3 The raw data table for H in week 4

		Domain Categorisation			Element Matching					
					R		P		I	
4	H017	1	1	1	3	C	3	D	3	C
4	H018	1	1	1	3	C	3	D	3	C
4	H019	1	1	1	3	C	3	C	3	C
4	H020	1	1	1	5	A	4	C	4	D
4	H021	1			5	B				
4	H022	1	1	1	4	B	4	A	3	C
4	H023	1	1	1	3	B	3	B	3	A
4	H024	1	1	1	3	B	3	B	3	A
4	H025		1	1			3	A	3	A
4	H026	1	1	1	3	D	3	C	3	A
4	H027	1	1	1	3	B	3	B	3	C
4	H028	1	1	1	4	D	4	B	4	D
4	H029	1			5	A				
4	H030		1				3	D		

The following stack profile (Fig. L.3) summarises the musical development mapping in week 4 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 4 in the proactive and level 3 to 4 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 3, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
4	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	7	58	P3	9	75	I3	9	82
	R4	2	17	P4	3	25	I4	2	18
	R5	3	25	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	12	100	Total	12	100	Total	11	100

Fig. L.3 Stack profile for H in week 4

Week 6

The teacher demonstrated the use of the switch to link musical phrases together to sing a song. H volunteered to do the task and he pressed the switch four times in rather good

timing on (3 3 3 5 | 3 3 3 2 | 1 · 2 3 2 | 1 1 | 3 3 3 5 | 3 3 3 2 | 1 12 1 5 | 6 6 ‖) to link the four phrases together twice (R5A, P5A). However, when the teacher asked H how many times a student needed to press the switch in the song, H indicated 'one' (R2D, P2C). H did not seem to understand the question which related to his own movement or the concept of numbers.

It was while H was being a leader in the 'leader and copycat' activity that he pressed the switch to sing the sound 'lu' on the melody (3 3 3 5 | 3 3 3 2 | 1 · 2 3 2 | 1 1 | 3 3 3 5 | 3 3 3 2 | 1 12 1 5 | 6 6 ‖) for each musical phrase, and the rest of the group copied his switch singing. The turn taking went well and H concentrated while listening and waiting for the group to finish before he pressed the next musical phrase (R4C, P4B, I4D).

Here, H and the teacher are the clappers and they clapped the first and third phrases (♫♫ | ♫♫ |) of the song. Another student pressed the switch to sing the second (1 · 2 3 2 | 1 1 |) and fourth phrases (1 12 1 5 | 6 6) of the song. They took turns to clap and sing the song. H's clapping was delayed the first time. On the second time, his clapping was better on the beat. He was able to keep a rather good beat on the quaver with the teacher in time (R4B, P4A, I4D).

H volunteered to use two switches to sing the song. H switched well between two switches and linked two phrases together all by himself and in good timing. One switch clapped the rhythm of the first four bars (♫♫ | ♫♫ | ♪.𝅘𝅥𝅯 ♪♪ | ♩ 𝅗𝅥). Another switch sang '3 3 3 5 | 3 3 3 2 | 1 12 1 5 | 6 6 ‖'. He did the song twice by following the teacher's instruction well (R5A, P4C, I4C).

In group practice, H and another student worked together in a group. H was doing the clapping (♫♫|♫♫|♪.𝅘𝅥𝅯 ♪♪|♩ 𝅗𝅥|) with a TA and the other student was doing the singing part (3 3 3 5 | 3 3 3 2 | 1 12 1 5 | 6 6). In the practice, the TA slowed

down the clapping for H. He did better on quavers and crochets with a bit of delay, but found it difficult to clap the dotted quaver and semiquavers. He was often delayed in his clapping for the second phrase (♪.♬ ♪♪ | ♩ ♩ |) (R3B, P3C, I3C).

After their practice, H answered clearly to the teacher's question by calling out 'yeah' when the teacher announced that H was in charge of clapping (P3D). H and his partner performed in front of the class, although H's clapping was not quite in time and in rhythm. His clapping was delayed and he clapped after the TA (R3A, P3C, I3C). Table L.4 summarises the coding in week 6 for H:

Table L.4 The raw data table for H in week 6

		Domain Categorisation			Element Matching					
					R		P		I	
6	H031	1	1		5	A	5	A		
6	H032	1	1		5	A	5	A		
6	H033	1	1		2	D	2	C		
6	H034	1	1	1	4	C	4	B	4	D
6	H035	1	1	1	4	B	4	A	4	D
6	H036	1	1	1	5	A	4	C	4	C
6	H037	1	1	1	3	B	3	C	3	C
6	H038		1				3	D		
6	H039	1	1	1	3	A	3	C	3	C

The following stack profile (Fig. L.4) summarises the musical development mapping in week 6 for H. His musical behaviours ranged from level 2 to 5 in the reactive domain, level 2 to 5 in the proactive and level 3 to 4 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 3 and 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
6	R1	0	0	P1	0	0	I1	0	0
	R2	1	13	P2	1	11	I2	0	0
	R3	2	25	P3	3	33	I3	2	40
	R4	2	25	P4	3	33	I4	3	60
	R5	3	38	P5	2	22	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	8	100	Total	9	100	Total	5	100

Fig. L.4 Stack profile for H in week 6

Week 7

Week 7 was near the school half term. In this week the students had a music ICT lesson. The aims of the lesson were to open a software, to arrange some music on it, to save the composition and give it a name. H was working with another student to share a computer. The teacher instructed H's group to move along or drag over the base line to make the base line longer than the song. In this lesson, H said 'yeah', in response to the teacher's instructions, several times (R3C, P3D, I2C). It was difficult to know how much H had understood the teacher's instruction and the aims of the lesson. Table L.5 summarises the coding in week 7 for H:

Table L.5 The raw data table for H in week 7

		Domain Categorisation			Element Matching					
					R		P		I	
7	H040	1	1	1	3	C	3	D	2	C
7	H041	1	1	1	3	C	3	D	2	C

The following stack profile (Fig. L.5) summarises the musical development mapping in week 7 for H. His musical behaviours ranged from level 3 in the reactive domain, level 3 in the proactive and level 2 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 2, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
7	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	2	100
	R3	2	100	P3	2	100	I3	0	0
	R4	0	0	P4	0	0	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	2	100	Total	2	100	Total	2	100

Fig. L.5 Stack profile for H in week 7

Week 11

After the school half term, in that day's lesson the teacher printed out on different papers the words from the Red Nose Day's theme song. The teacher scattered the papers on the floor and randomly picked one sheet of paper for each student. The students were asked to put the words in the right order among themselves. When the teacher helped the students to check who had got the first and then the second line, H raised his hand and said 'me' (R4B, P4C, I4C). It seemed that H had recognised some of the words that belonged to the second line in the song, and he was confident about it.

For the first line, the lyric was 'make someone happy by showing you care' (3 3 12 2 1 1 5 | 6 1 2 3 3 – |) and the second line was 'do what you can to make a difference somewhere' (3 3 12 2 1 6 1 | 2 2 76 5 5 –). The third line was 'let's be positive and make it worthwhile' (5 6 32 1 1 1 | 6 1 2 ♭3 ♭3 3) and the fourth line was 'we can break this poverty and help people smile' (21 · 6 5 32 1 1 6 | 1 1 2 1 1 – ‖). When the teacher checked the students' answers, H got the second phrase right and he came up front to sit next to the student who had got the first line (R4B, P4C, I4C).

The teacher then mixed up the words again and asked the students to do the same task. This time H had the first line and when the teacher asked who had the first line, H said 'me'. H seemed to recognise the words and the music and he responded quickly and well to the teacher's question (R5A, P4C, I4C). Then the teacher asked H to go up to the front line.

When the teacher asked H to sing with him on the musical phrase 'make someone happy by showing you care' (3 3 12 2 1 1 5 | 6 1 2 3 3 – |), H seemed to mouth the words but his voice was soft and not quite audible. From the teacher's comment, H seemed to mouth the last word 'care' when the teacher left a gap for him to sing (R4B, P4A, I4C). On their second practice, for the same phrase, H sang 'care' in an audible voice when the teacher waited for him and gave him the space and time to sing and respond (R5A, P5A, I4D).

When the students sang with the CD accompaniment, it was hard to tell if H sang along with the recording or to what degree he participated in singing the first musical phrase (R3A, P3A, I3A) for four times. When singing from the start in taking turns with other students, H's voice was heard when he sang 'care' along with the recording for his musical phrase 'make someone happy by showing you care' (3 3 12 2 1 1 5 | 6 1 2 3 3 – |) (R5A, P5A, I5A).

The teacher asked H to say the poem 'Jack be nimble, Jack be quick, Jack jumped over the candle stick' (♪♪ ♪♪. | ♪♪ ♩ | ♪♪ ♪♪♪ | ♪♪ ♩ ‖). The teacher said a few words and H followed after the teacher. H copied or vocalised near the end of every phrase but did not exactly copy the words. For example,
T: 'Jack be nimble'. H copied and said '(nim) ble'.
T: 'Jack be quick'. H said 'quick'.
T: 'Jack jumped over'. H said 'ye'.
T: 'the candle stick'. H said 'ye' (R4B, P4A, I3C).

In group ensemble poem chanting, three students were in charge of tapping and speaking 'nimble quick, nimble quick' (♪♪. | 𝅗𝅥). The other student was in charge of 'Jack jumped over, Jack jumped over' (♪♪ | ♪♪). K was assigned to tap a steady beat. H was assigned to use the switch to produce a drumming pattern. H pressed the switch to activate the drumming, and he beat the cymbal sounds well in this ensemble (R5A, P5A, I5B). Table L.6 summarises the coding in week 11 for H:

Table L.6 The raw data table for H in week 11

		Domain Categorisation			Element Matching					
					R		P		I	
11	H042	1	1	1	4	B	4	C	4	C
11	H043	1	1	1	4	B	4	C	4	C
11	H044	1	1	1	5	A	4	C	4	C
11	H045	1	1	1	4	B	4	A	4	C
11	H046	1	1	1	5	A	5	A	4	D
11	H047	1	1	1	3	A	3	A	3	A
11	H048	1	1	1	3	A	3	A	3	A
11	H049	1	1	1	3	A	3	A	3	A
11	H050	1	1	1	3	A	3	A	3	A
11	H051	1	1	1	5	A	5	A	5	A
11	H052	1	1	1	4	B	4	A	3	C
11	H053	1	1	1	5	A	5	A	5	B

The following stack profile (Fig. L.6) summarises the musical development mapping in week 11 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 5 in the interactive domain. The modes for the reactive domain located at level 3, 4 and 5, the proactive domain at level 4 and the interactive domain at level 3 and 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
11	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	4	33	P3	4	33	I3	5	42
	R4	4	33	P4	5	42	I4	5	42
	R5	4	33	P5	3	25	I5	2	17
	R6	0	0	P6	0	0	I6	0	0
	Total	12	100	Total	12	100	Total	12	100

Fig. L.6 Stack profile for H in week 11

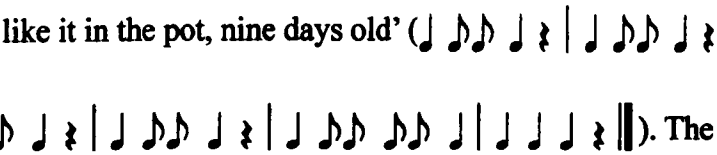
Week 12

Week 12 was near the school Easter break. In this week, the teacher was working with H on the poem 'Jack be nimble, Jack be quick, Jack jumped over the candle stick' (𝅘𝅥𝅮𝅘𝅥𝅮 𝅘𝅥𝅮𝅘𝅥𝅮. | 𝅘𝅥𝅮𝅘𝅥𝅮 𝅘𝅥 | 𝅘𝅥𝅮𝅘𝅥𝅮 𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯 | 𝅘𝅥𝅮𝅘𝅥𝅮 𝅘𝅥 ‖). H chose to do the same task as another student who imitated the teacher after each musical phrase. Here was the example,

T: Jack be nimble? Jack be nimble. H: Hmm.
T: Jack be quick. Jack. H: Jack.
T: be quick H: ye.
T: Jack H: Jack.
T: jumped over. H: ye.
T: the H: ye.
T: candle stick. H: ye (R4B, P4B, I3C).
The teacher then commented 'fantastic...very very good indeed'.

The teacher appointed H and another two students to read the poem in a small group. When the four of them, including the teacher, read the poem, it was hard to tell how much H was involved in saying the poem because his voice was so quiet. From the teacher's later comment, H seemed to have performed well within his capacity (R3C, P3C, I3C). When performing in front of the class, H participated in the activity but it was hard to hear his voice. But he seemed to do well with the poem reading (R3C, P3C, I3C). The teacher commented 'fantastic. Thank you very much. H. you said those words really really nicely. Well done'.

The teacher provided one pattern drumming to go with their poem reading and asked H if he liked it. H indicated that he did not (R3D). Later on, the teacher provided four numbers of drumming pattern choices from the computer and asked the students which one they liked best. After listening to each one of them, H said 'four' to make his choice (R4A, P3D, I3C). When the students listened back to their poem chanting with the drumming pattern, the teacher asked H if it was perfect or needed more work. H indicated and pointed to the teacher's hand suggesting that it 'needs a bit of work' (R4A, P3D, I3C).

The teacher worked on another poem and the poem went like this 'Pease pudding hot, Pease pudding cold, Pease pudding in the pot, nine days old. Some like it hot, Some like it cold, Some like it in the pot, nine days old' (). The teacher asked H to vocalise a sound 'blaaaa' (as getting sick) and put it in the right place of the poem 'Pease pudding hot' and H vocalised 'ba' quietly (R3A, P3D, I3C). Between each phrase, the teacher asked the student to do the action and vocalisation on blowing, shivering and getting sick. Therefore, the action poem became 'Pease pudding hot (blow sounds), Pease pudding cold (shivering sound), Pease pudding in the pot, nine days old (blaaa). Some like it hot (blow sounds), some like it cold (shivering sounds), some like

it in the pot, nine days old (blaaa)'. Twice H participated in the activity, while imitating the others students' movement and sounds (R3C, P3D, I3C). However, his sounds were very quiet and difficult to distinguish in a group context. Table L.7 summarises the coding in week 12 for H:

Table L.7 The raw data table for H in week 12

		Domain Categorisation			Element Matching					
					R		P		I	
12	H054	1	1	1	4	B	4	B	3	C
12	H055	1	1	1	3	C	3	C	3	C
12	H056	1	1	1	3	C	3	C	3	C
12	H057	1			3	D				
12	H058	1	1	1	4	A	3	D	3	C
12	H059	1	1	1	4	A	3	D	3	C
12	H060	1	1	1	3	A	3	D	3	C
12	H061	1	1	1	3	C	3	D	3	C
12	H062	1	1	1	3	C	3	D	3	C

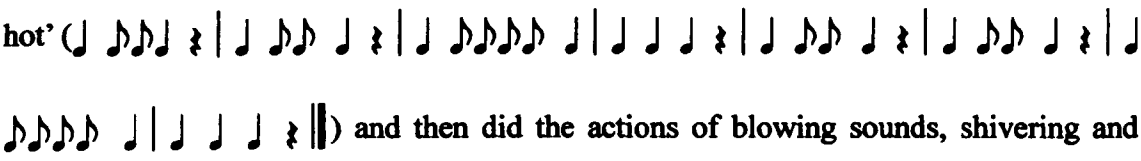
The following stack profile (Fig. L.7) summarises the musical development mapping in week 12 for H. His musical behaviours ranged from level 3 to 4 in the reactive domain, level 3 to 4 in the proactive and level 3 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 3, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
12	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	6	67	P3	7	88	I3	8	100
	R4	3	33	P4	1	13	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	9	100	Total	8	100	Total	8	100

Fig. L.7 Stack profile for H in week 12

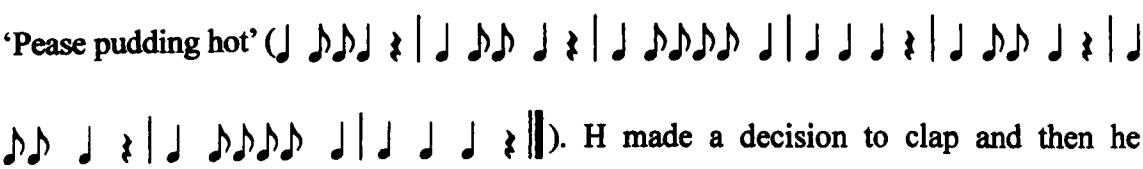
Musical behaviours and development of H in term two (the school summer term): weeks 14 to 23

Week 14

After the school's Easter break, the students came back to the school in week 14. In the beginning of today's lesson, the teacher clapped the rhythm of the poem 'Pease pudding hot' () and then did the actions of blowing sounds, shivering and getting sick. Near the end of the teacher's demonstration, H seemed to recognise the poem and said 'oh, yeah' (R4A, P3D).

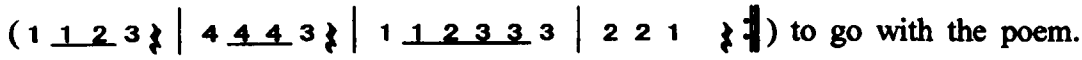
In the pair interactive activity, H and K worked together. K pressed the switch to read the poem and H tapped on the big tambour when there was a rest at the end of every phrase. H's drumming was accurate when taking turns with K, and was increasingly better, in time. The teacher helped H to play the drum, giving only a partial verbal prompt (R4B, P4B, I4D). On their second practice, H listened well to the poem and took turns correctly with K in good timing (R5A, P5A, I4D). The teacher commented, "Fantastic work, H, very good listening".

In the poem reading task, the teacher asked H to imitate the words while another student did a loud banging sound on a drum. Their reading went like this:
T: Pease pudding hot. H: Pease.
T: Pease pudding cold. Pease pudding in the pot, nine days. H: days.
T: old. H: ye.
T: some like it hot. H: like it (same time as T).
T: some like it cold. H: like it (same time as T).
T: some like it in the pot, nine days old. H: old. (R4B, P3D, I3C).

The teacher asked each student to think of a sound to make by tapping, clapping, or vocalising when the teacher stopped tapping on the rhythmic patterns for the poem 'Pease pudding hot' (). H made a decision to clap and then he demonstrated the clapping (P3D). H clapped a sound after the teacher's drumming pattern. H seemed to do very good work in taking turns with the teacher (R4D, P4D, I4D). After the practice, TAs commented that H did excellent work and was top of the

class. On the second practice, the teacher tapped the rhythm very quietly on a drum for a change. H tapped quietly following the teacher's modelling on the rhyme 'Pease pudding hot' (R4D, P4D, I4D).

The teacher played on the piano the tune:



to go with the poem. The students were asked to tap a sound when there was a pause in the tune. H's tapping was quiet but he seemed to take turns well with the teacher (R4B, P4A, I4D).

When introducing a new note in the music lesson, the teacher reviewed what the students had learned on the notes of 'doh, re, mi, and sol'. Today they were going to learn a new note that appeared in the song. The teacher demonstrated by singing the whole song again while missing out the new note (fa), H responded by saying 'Oh, Yeah!' It seemed that H gave more verbal response towards the teacher's teaching than before, with even more enthusiasm (R4D, P3D).

When the teacher recorded his singing on the switch and asked for help to work the switch, H volunteered and spoke in a loud voice 'me!' H pressed the switch in good timing by himself for the whole song (R5A, P5A). On the second practice, H showed some hesitation when pressing the switch, which left some pauses between the phrases (R5A, P4B). The teacher corrected H and wanted him to link the musical phrases together without leaving any space between them. H did better switching with accurate timing on this occasion (R5A, P5A). Table L.8 summarises the coding in week 14 of H:

Table L.8 The raw data table of H in week 14

		Domain Categorisation			Element Matching					
					R		P		I	
14	H063	1	1		4	A	3	D		
14	H064	1	1	1	4	B	4	B	4	D
14	H065	1	1	1	5	A	5	A	4	D
14	H066	1	1	1	4	B	3	D	3	C
14	H067		1				3	D		
14	H068	1	1	1	4	D	4	D	4	D
14	H069	1	1	1	4	D	4	D	4	D
14	H070	1	1	1	4	B	4	A	4	D
14	H071	1	1		4	D	3	D		
14	H072	1	1		5	A	5	A		
14	H073	1	1		5	A	4	B		
14	H074	1	1		5	A	5	A		

The following stack profile (Fig. L.8) summarises H's musical development mapping in week 14. His musical behaviours ranged from level 4 to 5 in the reactive, level 3 to 5 in the proactive and level 3 to 4 in the interactive domains. The modes for the reactive, proactive and interactive domains were all located at level 4.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
14	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	4	33	I3	1	17
	R4	7	64	P4	5	42	I4	5	83
	R5	4	36	P5	3	25	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	11	100	Total	12	100	Total	6	100

Fig. L.8 Stack profile of H in week 14

Week 15

In the beginning of the lesson the teacher clapped the rhythmic patterns of the poem 'Pease pudding hot' (♩ ♪♪♩ 𝄽 | ♩ ♪♪ ♩ 𝄽 | ♩ ♪♪♪♪ ♩ | ♩ ♩ ♩ 𝄽 | ♩ ♪♪ ♩ 𝄽 | ♩ ♪♪ ♩ 𝄽 | ♩ ♪♪♪♪ ♩ | ♩ ♩ ♩ 𝄽 ‖) and did the action and sounds of blowing, shivering and getting sick. The teacher then asked the students who had remembered it. H indicated that he had remembered the song (R4A).

In pair ensemble work, K chose H to be her partner and they sat face to face when they did the task. K switched the song

(1 1 2 3 𝄽 | 4 4 4 3 𝄽 | 1 1 2 3 3 3 | 2 2 1 𝄽 :‖) and the teacher and H did the clapping on the end of each musical phrase. H clapped well with the teacher in taking turns with K and he showed good timing in his task (R5A, P5A, I5A).

When the teacher instructed the students to represent different notes, he assigned H with the note of 'mi'. H sang the note 'mi' quietly when it was his turn to take turns with his peers in their initial practice (R4B, P3A, I3C). Then when given options by the teacher to use his singing voice or the switch, H chose to use the switch to sing his note (P3D). In the formal practice, H sang the note 're' after he heard the switch of 'do' being pressed. He then pressed his own note 'mi' in good timing in the song in taking turns

with his peers – with good anticipation and concentration (R5A, P4D, I4D). On the second practice, H switched in time well in taking turns with other pupils (R5A, P4D, I4D). On their third practice with clappers, H switched in time and also well when taking turns with other students (R5A, P4D, I4D).

When the teacher suggested that he was not going to give any instructions and would let the students sing the song in turn by themselves, the students improvised on the notes that they were given but did not follow the original tune. H switched with the note 'mi' and improvised with others (R5A, P4A, I4D). Later, the teacher gave instructions to the students to sing the song again. H switched in good timing with the teacher's help – and in the right order with his peers when taking turns on the original tune (1 1 2 3 | 4 4 4 3 | 1 1 2 3 3 3 | 2 2 1 ||) (R5A, P4B, I4D).

The teacher assigned a short music motif to each student. One student had a musical phrase (5 3 5 4 | 3 – – –) and the other had a musical phrase (5 4 3 2 | 1 – – –). H had a musical phrase (5 3 4 3 | 2 – – –) and K had a musical phrase (3 4 3 3 | 2 3 – –). Each student followed the teacher's instruction to press the switch. H pressed the switch in good timing when the teacher pointed to him (R4B, P4B, I4D). In order to distinguish their own musical phrases, the teacher played a tune on the piano and asked the students to press the switch or sing it back to the teacher. When the teacher sang 'So mi fa mi re' (5 3 4 3 | 2 – – –), H pressed the switch the minute the teacher finished his singing (R4A, P4A, I4A). TAs also clapped H's good work.

When the teacher sang 'so fa mi re do' (5 4 3 2 | 1 – – –), a student indicated that that was her phrase but she was wrong. The teacher said 'no' and sang the phrase again, and another student hit a switch, and he was right. When the teacher commented and gave praise to the student, H said 'no, no no' (R4C). It was not clear whether H was imitating the teacher's previous answer, or whether he had a different opinion.

When the teacher wanted to introduce a new song and borrowed H's switch, H said in a loud voice 'me, me, me!' as he had already volunteered to do the new task not even knowing what it was (P3D). The teacher then recorded his singing on the switch 'Once

a man fell in a well, splish splash splush he sounded, if he had not fallen in, he would not have drowned'

(1 2 3 4 5 5 5 | 1 2 3 4 5 5 | 1 2 3 4 5 5 5 | 5 4 3 2 1 1). When the teacher asked for a helper, H indicated that he wanted to help. H listened to each line carefully and he pressed the switch on his own in good timing for the whole song, twice (R5A, P5A, I4C). Table L.9 summarises the coding in week 15 for H:

Table L.9 The raw data table for H in week 15

		Domain Categorisation			Element Matching					
					R		P		I	
15	H075	1			4	A				
15	H076	1	1	1	5	A	5	A	5	A
15	H077	1	1	1	4	B	3	A	3	C
15	H078		1				3	D		
15	H079	1	1	1	5	A	4	D	4	D
15	H080	1	1	1	5	A	4	D	4	D
15	H081	1	1	1	5	A	4	D	4	D
15	H082	1	1	1	5	A	4	A	4	D
15	H083	1	1	1	5	A	4	B	4	D
15	H084	1	1	1	4	B	4	B	4	D
15	H085	1	1	1	4	B	4	B	4	D
15	H086	1	1	1	4	A	4	A	4	A
15	H087	1			4	C				
15	H088		1				3	D		
15	H089	1	1	1	5	A	5	A	4	C

The following stack profile (Fig. L.9) summarises the musical development mapping in week 15 for H. His musical behaviours ranged from level 4 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 4 and the interactive domain at level 4, respectively.

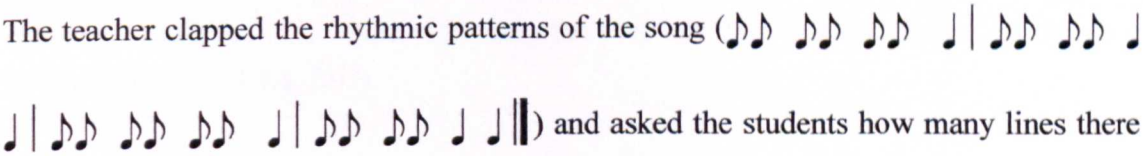
WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
15	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	3	23	I3	1	9
	R4	6	46	P4	8	62	I4	9	82
	R5	7	54	P5	2	15	I5	1	9
	R6	0	0	P6	0	0	I6	0	0
	Total	13	100	Total	13	100	Total	11	100

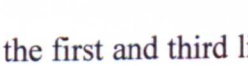
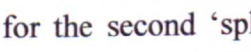
Fig. L.9 Stack profile for H in week 15

Week 16 (start of video recording)

Week 16 was the week before the school break. On singing the song 'once a man fell in the well', the teacher gave H two choices – either to use the switch or his voice. H chose to use the switch to sing the song. He had good switching and clear hand movements (R5A, P4C). The teacher wanted to encourage him to use his voice and asked H to sing the song by imitating each phrase after the teacher. H produced a few single words at the end of each musical phrase and sometimes sang simultaneously with the teacher (R5A, P4A, I4D). Here was an example:

T: Once a. H: a.
T: man fell in the. H: well.
T: splish splash splush he sounded. H: sounded (together with the teacher).
T: If he had not fallen in, he would not have drowned. H: drawn.
T: fantastic. Very good singing. Well done.

The teacher clapped the rhythmic patterns of the song () and asked the students how many lines there were in the song by offering two choices – ten or four lines. H pointed to the teacher's hand that represented 'four' and he seemed to say 'four' (R5B).

The teacher offered H either to be in the clapping group or in the singing group. H said 'clapping' which meant he wanted to be in the clapping group (R3D, P3D). The teacher recorded the singing for the singing group on the switch. The clapping group clapped the first and third line () and the singing group switched the singing for the second 'splish, splash, splush he sounded' () and the fourth

phrase 'he would not have drowned' (5 4 3 2 1 1) of the song. In the clapping group, H seemed to do a really good job in keeping good distinctive rhythmic patterns while taking turns with the singing group (R4A, P4A, I4A). The teacher changed the singing group into the clapping group and vice versa. H was in the singing group this time. He seemed to sing with the rest of his group when it was their turn (R4B, P4B, I4A).

In alternation of thinking voice and singing voice, the students were imitating the teacher's action by quietly tapping the rhythm for the first and third phrases (♪♪ ♪♪ ♪♪ ♩ |) and sang the second 'splish, splash, splush he sounded' (1 2 3 4 5 5 |) and the fourth phrases 'he would not have drowned' (5 4 3 2 1 1). The thinking voice meant the teacher sang the phrases in his head and used a finger to tap the rhythmic patterns or the beat quietly on his head. H seemed to join in the group practice by imitating others' movement and singing (R3C, P3C, I3C). On individual work, H was asked to do the thinking voice on the first and third phrases and then switch to singing the second and fourth phrases. H had good waiting and switching in time for the whole of the song and was able to link the four phrases together with the teacher's partial prompting by the teacher tapping his own head (R5A, P5A).

The teacher wanted H to sing the notes of the song 'doh re mi fa sol sol sol, doh re mi fa sol sol, doh re mi fa sol sol sol, sol fa mi re doh doh' (1 2 3 4 5 5 5 | 1 2 3 4 5 5 | 1 2 3 4 5 5 5 | 5 4 3 2 1 1) and moved his hand up and down according to the high and low notes. From the teacher's comment, H seemed to do the task well and he sang the very last two 'dohs' at the end of the song by himself (R5A, P4A, I4D).

The teacher introduced a song

(1 1 2 𝄽 | 1 1 3 𝄽 | 1 1 2 𝄽 | 1 3 4 𝄽 | 3 3 4 𝄽 | 3 3 2 𝄽 | 3 3 4 𝄽 | 3 2 1 𝄽 ‖) with a jazz CD accompaniment. The students were asked to press the switch to say the texts 'yeah, ah ha, hit it, that's cool, yeah, ah ha, hit it, I am done' when there was a pause in the melody. H volunteered to perform on the task and he did well to press his part when taking turns with the CD jazz music which formed an ensemble (R5A, P5A, I5A).

In group practice, the teacher asked H to press the switch to read the text while the other students sung the song. In the first instance, H did not press the switch hard enough to make it sound. At the second time, H pressed the switch before the teacher and other students had finished their singing. At the third time, H pressed the switch, but with a delayed response, and he missed out on one of his turns (R4C, P4B, I4D). Maybe H needed the teacher's constant physical cue to tell him when he needed to press the switch, otherwise he missed his turn and found it hard to keep it in time with the CD music.

The teacher asked the other students to sing the song again with their hand movements, and H to do the switch in reading the text. The group sang the notes with the CD accompaniment and taking turns with H on his switch. H pressed the switch well without the staff's physical assistance (R5A, P5A, I5A). Table L.10 summarises the coding in week 16 for H:

Table L.10 The raw data table for H in week 16

		Domain Categorisation			Element Matching					
					R		P		I	
16	H090	1	1		5	A	4	C		
16	H091	1	1	1	5	A	4	A	4	D
16	H092	1			5	B				
16	H093	1	1		3	D	3	D		
16	H094	1	1	1	4	A	4	A	4	A
16	H095	1	1	1	4	B	4	B	4	A
16	H096	1	1	1	3	C	3	C	3	C
16	H097	1	1		5	A	5	A		
16	H098	1	1	1	5	A	4	A	4	D
16	H099	1	1	1	5	A	5	A	5	A
16	H100	1	1	1	4	C	4	B	4	D
16	H101	1	1	1	5	A	5	A	5	A

The following stack profile (Fig. L.10) summarises the musical development mapping in week 16 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
16	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	2	17	P3	2	18	I3	1	13
	R4	3	25	P4	6	55	I4	5	63
	R5	7	58	P5	3	27	I5	2	25
	R6	0	0	P6	0	0	I6	0	0
	Total	12	100	Total	11	100	Total	8	100

Fig. L.10 Stack profile for H in week 16

Week 18

Week 18 was the week before half term and the school inset day. In this week, the teacher introduced the toreador song from Carmen. H turned his head towards the TV and he showed concentration while watching the TV (R4A).

In a role-play, the teacher wheeled in another student as a toreador and hummed the song. At this point, H imitated the TAs' movement by clapping his hands. He then touched the teacher and pointed to himself which meant he also wanted to be a toreador. Later on, while watching the TV, H listened intently to the toreador song in the opera Carmen (R4A, P3D).

In another drama rehearsal, H was chosen to be a bull and made a bull's sound, and the teacher was a toreador. H was familiar with using the power on his wheelchair and moved fast towards the red cloth. H raised his head and made some soft sounds (P3D). H looked at the teacher and knew where he was going.

In composing their own toreador march, the teacher asked the students' opinion on the tempo – fast or slow. H said 'slow' but when the teacher asked him again, he pointed to the teacher's hand which represented 'fast' (P3D). Later, the teacher asked everyone to tap the set-up speed and H used his left hand to tap on his knee, but not exactly keeping the same tempo as the teacher (R3B, P3A, I3A). In another practice, H clapped his hands and followed the teacher's beat. Sometimes he was with the teacher but sometimes he was not (R4A, P3B, I3C).

With some background drumming patterns and a simple melodic tune, H marched with the rhythm, in his wheelchair, and he followed the teacher's instruction and waved at the audience (R4A).

When the teacher asked the students' opinion on the instrumental arrangement for their toreador march, the teacher said 'I don't think we need a piano in there' and H vocalised and said 'yes' in agreement with the teacher (P3D). H also listened to different drumming patterns and said 'I like that one' when he heard one particular pattern (R4A, P3D). When the teacher tried out different rhythms on the computer, he asked H's opinion whether to keep it or to change it. H nodded to the direction of the teacher's hand which represented 'keep it' (R4A, P3D). At the end of the lesson, the teacher used the computer to play to the students what they had done so far for their toreador march music. The teacher asked whether it was better and H said 'yeah' (R4A, P3D). Table L.11 summarises the coding in week 18 for H:

Table L.11 The raw data table for H in week 18

		Domain Categorisation			Element Matching					
					R		P		I	
18	H102	1			4	A				
18	H103	1	1		4	A	3	D		
18	H104		1				3	D		
18	H105		1				3	D		
18	H106	1	1	1	3	B	3	A	3	A
18	H107	1	1	1	4	A	3	B	3	C
18	H108	1			4	A				
18	H109		1				3	D		
18	H110	1	1		4	A	3	D		
18	H111	1	1		4	A	3	D		
18	H112	1	1		4	A	3	D		

The following stack profile (Fig. L.11) summarises the musical development mapping in week 18 for H. His musical behaviours ranged from level 3 to 4 in the reactive domain, level 3 in the proactive and level 3 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 3 and the interactive domain at level 3, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
18	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	1	13	P3	9	100	I3	2	100
	R4	7	88	P4	0	0	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	8	100	Total	9	100	Total	2	100

Fig. L.11 Stack profile for H in week 18

Week 19

After the break for half term and the school Inset day, the students started their music lesson again in week 19. In week 19, the music lesson focused on exploring the various sound qualities and different instrumental sounds. The teacher asked H to try a new instrument or a toy that the teacher had bought. H said 'yeah' and he played the instrument well by tipping it over, which produced a funny sound (R3A, P3A). The teacher then joked about it and said 'oh, I beg your pardon' and H imitated the teacher by saying 'I beg yo (ur)'. Everyone in the class laughed.

In distinguishing the quality of sounds for the musical instruments, the teacher played a cymbal and asked H's opinion as to whether it was a rough or smooth sound. H indicated 'smooth' and the teacher repeated after him to confirm and H said 'yeah' (R3A, P3D). When the teacher played a shaker and asked if this made a rough or smooth sound. Most of the students said it was rough. Then the teacher played another sound and asked for H's opinion and he said 'smooth' (R3A, P3D).

With an exaggerated expression, the teacher wanted the students to think about the contrasting sound quality of 'loud' and 'quiet'. The students were asked to close their eyes and everyone was laughing and appeared to be excited. The teacher played a quiet sound on the drum and the student said 'quiet. The second sound the teacher played was a loud sound on the cymbal. Some students got very excited and laughed. Later on, the teacher played a quiet sound on the cymbal and asked the student's opinion. One student said 'quiet'. Then the teacher quietly played a soft sound on the wood block and he asked H if it was loud or quiet and H said 'quiet' (R3C, P3D).

While reviewing the rough and smooth, high and low, loud and quiet sound quality, the teacher introduced the concept of fast and slow with speed. The teacher played a slow sound on the drum to begin with, and then he turned it into fast sounds. When the

teacher reviewed the sounds they had learned that day, H said 'rough' (R3A, P3D) and the teacher continued to say 'and smooth'. H looked at the teacher, with good concentration.

When drawing symbols to represent the different quality of sounds, the teacher drew some signs and these signs represented the different sounds that they had made that day. For the tiny dots, the teacher asked H whether they were short or long sounds and H indicated that they were for short sounds (R3D, P3D). H raised his left hand and used his left hand index finger to point to the instrument. Then the teacher gave him a beater and an African percussion. H played on the instrument and he tried out the sounds by following the teacher's instruction (R3C, P3D).

When the teacher pointed to the symbols which represented different sounds, the students played their instruments and sounds accordingly. Each student was also assigned different symbols. When it was H's turn, the teacher whispered H's name and H played on the African instrument for two beats. Then the teacher asked him to play two more beats and H followed the instruction. He played on the instrument, using his right hand to hold the beater and left hand to hold the instrument. He played a few notes on the instrument following the teacher's instruction (R3D, P3D, I3C).

The teacher pointed to another student to be a new conductor. The new conductor pointed to the signs, and the rest of the students made the sounds. H seemed to listen well towards his peer's instruction, with good concentration. When it was his turn, the teacher whispered H's name. Then H started to play on the instrument. H played a few notes by himself when the student pointed to the symbols (R3C, P3C, I3C). H later smiled at a TA while waiting for his turn. Table L.12 summarises the coding in week 19 for H:

Table L.12 The raw data table for H in week 19

		Domain Categorisation			Element Matching					
					R		P		I	
19	H113	1	1		3	A	3	A		
19	H114	1	1		3	A	3	D		
19	H115	1	1		3	A	3	D		
19	H116	1	1		3	C	3	D		
19	H117	1	1		3	A	3	D		
19	H118	1	1		3	D	3	D		
19	H119	1	1		3	C	3	D		
19	H120	1	1	1	3	D	3	D	3	C
19	H121	1	1	1	3	C	3	C	3	C

The following stack profile (Fig. L.12) summarises the musical development mapping in week 19 for H. His musical behaviours ranged from level 3 in the reactive domain, level 3 in the proactive and level 3 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 3, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
19	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	9	100	P3	9	100	I3	2	100
	R4	0	0	P4	0	0	I4	0	0
	R5	0	0	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	9	100	Total	9	100	Total	2	100

Fig. L.12 Stack profile for H in week 19

Week 20

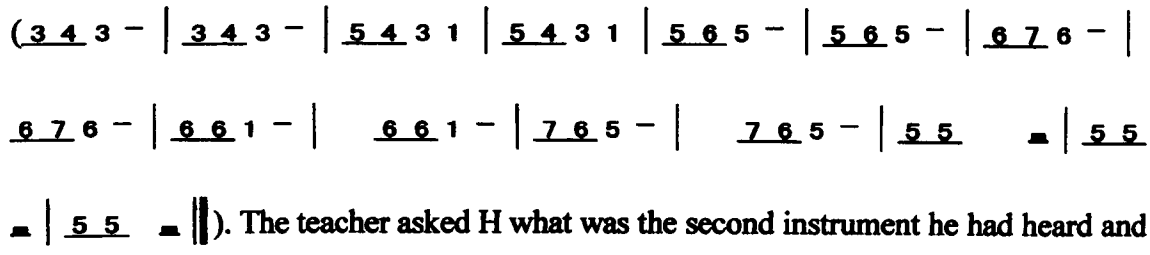
The teacher bought in a pair of sound blocks and let the students feel the rough surface on the instruments. H also felt the rough surface of the sound block (R2D). When the teacher played a scraper and asked H if it had a rough sound or a smooth sound, H was able to indicate that the scraper had a rough sound (R3A).

In choosing what kind of sound that the students liked to play, H chose a smooth sound. Then the teacher made a suggestion to H to rub the drum for a smooth sound (R3D). The teacher was being a conductor and he pointed to symbols on the board and then the students played their instruments accordingly. H rubbed the drum face when the conductor pointed to the symbol for smooth sounds, while taking turns with other students (R3D, P3D, I4D). Later, another student was chosen to be a conductor and H was watching so carefully every time the conductor pointed to a smooth sign. H also made really smooth sounds and he stroked the drum surface well following the conductor's pointing – with good concentration and participation. At times, the teacher whispered H's name when it was his turn (R3D, P3D, I4D).

H was chosen to be a conductor because he was the best musician in their last performance. H pointed to different signs and waited well for others to play their sounds before he pointed to the next one. He also tried to look around to see if the person was playing when he pointed to a sign. He would use his right hand to hold the stick to point

(R5A, P5B, I5B). When it was another student's turn to be a conductor, H played by himself after his TA had given him a hint that it was his turn. He seemed to concentrate well on the task (R3D, P3D, I4D).

In the activity of guessing what instrument the students had heard, the teacher used a song called 'the sound song' and the lyrics and music was 'Sounds we hear (in response: sounds we hear), through the window (in response: through the window), far and near (in response: far and near), soft and still (in response: soft and still), high and low (in response: high and low), loud and clear (in response: loud and clear). Listen! Listen! Listen!'



). The teacher asked H what was the second instrument he had heard and suggested a chime bar. H said 'yes' and nodded in answer to the teacher's suggestion (R3A, P3D). When the class clapped him, he raised his left hand in the air – maybe to show a gesture of happiness or appreciation. Table L.13 summarises the coding in week 20 for H:

Table L.13 The raw data table for H in week 20

		Domain Categorisation			Element Matching					
					R		P		I	
20	H122	1			2	D				
20	H123	1			3	A				
20	H124	1			3	D				
20	H125	1	1	1	3	D	3	D	4	D
20	H126	1	1	1	3	D	3	D	4	D
20	H127	1	1	1	5	A	5	B	5	B
20	H128	1	1	1	3	D	3	D	4	D
20	H129	1	1		3	A	3	D		
20	H130	1	1		3	A	3	D		

The following stack profile (Fig. L.13) summarises the musical development mapping in week 20 for H. His musical behaviours ranged from level 2 to 5 in the reactive domain, level 3 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 3, the proactive domain at level 3 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
20	R1	0	0	P1	0	0	I1	0	0
	R2	1	11	P2	0	0	I2	0	0
	R3	7	78	P3	5	83	I3	0	0
	R4	0	0	P4	0	0	I4	3	75
	R5	1	11	P5	1	17	I5	1	25
	R6	0	0	P6	0	0	I6	0	0
	Total	9	100	Total	6	100	Total	4	100

Fig. L.13 Stack profile for H in week 20

Week 21

The teacher wrote a poem on the board and asked the students how many lines the poem had. H stretched out three fingers immediately after the teacher's question and he indicated three lines in the poem. When the teacher confirmed with him, he said 'yeah' and nodded (R5B).

The poem was 'Owls are calling to the fireflies, come, come'. When the teacher asked a helper to read the poem, H volunteered to do the task by raising his left hand index finger and indicated that he wanted to be the helper. Here is an example of H reading the poem with the teacher:

T: Owls H: Owls

T: are calling H: calling.

T: to the fireflies. H: to.

T: come, come. H: come (R4A, P4A, I4A).

T: that is fantastic. Thank you for your reading.

The teacher asked the students where the poem had come from, and he offered several options such as England, Bangladesh, Turkey, Egypt, Africa or America. H nodded to the teacher's questions. When the teacher mentioned Bangladesh, H's eyes lit up! When the teacher mentioned America, H answered 'no' (R4A, P3D). Then the teacher wanted the students to guess if it was from Japan or other countries. H thought it was from Japan and he pointed to the teacher's hand that represented 'Japan' (R4A, P3D).

The teacher then confirmed that it was from Japan, and that the people there were very fond of this special kind of short poem. The teacher said it was called 'hikou', and H seemed to imitate the word 'hikou' after the teacher had said it (R3C, P3C, I3C).

When the students started to think about a night time sound, the teacher asked H if the sound was loud or quiet and H answered 'quiet' (R3D, P3D). The teacher put on quiet sounds on the Soundbeam and asked the students to make music using the Soundbeam. The teacher described a picture for night time and asked the students to think about people who were asleep and also about owls and fireflies who were wide awake making very quiet sounds. After the teacher had shown him, H moved his hand in front of the Soundbeam to create night time sounds. H played the night time music using the Soundbeam in making the night time music. When his first attempt did not produce any sounds, he seemed to gesture 'how does this work?', then after the teacher had asked him to move his hands again, he got some sounds. He also gestured his TA to move away. Most of the time, he used his left hand horizontally. Then he used both of his hands and liked drawing a circle when he got the idea of it (R5A, P5B).

H raised his hands and volunteered to try out different sounds on the keyboard to produce natural wildlife sounds. The teacher indicated which key he could press. Following the teacher's instruction, H pressed different keys to listen to their sounds. He did this all by himself. Then H explored the black keys as well on the keyboard in turn (R3D, P3D). Table L.14 summarises the coding in week 21 for H:

Table L.14 The raw data table for H in week 21

		Domain Categorisation			Element Matching					
					R		P		I	
21	H131	1			5	B				
21	H132	1	1	1	4	A	4	A	4	A
21	H133	1	1		4	A	3	D		
21	H134	1	1		4	A	3	D		
21	H135	1	1	1	3	C	3	C	3	C
21	H136	1	1		3	D	3	D		
21	H137	1	1		5	A	5	B		
21	H138	1	1		3	D	3	D		
21	H139		1	1			3	D	3	C

The following stack profile (Fig. L.14) summarises the musical development mapping in week 21 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 4 in the interactive domain. The modes for the reactive domain located at level 3 and 4, the proactive domain at level 3 and the interactive domain at level 3, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
21	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	3	38	P3	6	75	I3	2	67
	R4	3	38	P4	1	13	I4	1	33
	R5	2	25	P5	1	13	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	8	100	Total	8	100	Total	3	100

Fig. L.14 Stack profile for H in week 21

Week 22

Week 22 was near the school summer break and was the last lesson for the academic year 2006/2007. In making the decision on night time sounds, the teacher offered H two choices on loud or quiet. H touched the teacher's hand which represented quiet sounds (R3D, P3D). The teacher asked H to play a chime bar to represent the sound of fireflies. H played on the chime bar by himself to try out the sounds (R3A, P3A, I3A). In a group practice, H, K and another student rang their chime bar or pressed the switch to produce the sounds for fireflies. H seemed to lack enthusiasm to play, and his TA encouraged him to play more. He took his time and played long sounds rather slowly (R3A, P3A, I3A).

In using sounds to depict the poem 'Owls are calling to the fireflies, come, come', the teacher pointed to three students to use their vocalisation for long and deep sounds to produce the night time music. The teacher also chose three people, including H to use chime bars to produce the sounds for fireflies. The ending was signalled by an owl sound – played by another student using her switch when she thought the piece was long enough. In the initial practice, H played the chime bar several times by himself when it was his turn. Then his TA encouraged him to play more by giving him the playing gestures (R4D, P4D, I4D).

At the second practice, H played with more passion on the chime bar and faster, with his TA's encouragement. H kept playing his chime bar even though everyone else had obeyed the finishing sound that had been given by his fellow student. Then the teacher told him to stop. H seemed to be absorbed with his own playing (R5B, P5B, I5B). On the third practice, the teacher did not give any instruction to the students as to who should play next but waited to see if the students could remember their order and come in at the right place. H played the chime bar by himself in the right order (R5B, P5B, I5B). After their practice, everyone clapped themselves, and H used the chime bar as his

clapping sound. The teacher commented 'you know something, you are absolutely fantastic even without technology'.

A student was appointed to be a leader to start off the night time sound and to conduct the group which needed to play. H was instructed by his TA to pick up the chime bar and play. He did very well, with faster notes, and stopped at the right place (R5B, P5B, I5B). Table L.15 summarises the coding in week 22 for H:

Table L.15 The raw data table for H in week 22

		Domain Categorisation			Element Matching					
					R		P		I	
22	H140	1	1		3	D	3	D		
22	H141	1	1	1	3	A	3	A	3	A
22	H142	1	1	1	3	A	3	A	3	A
22	H143	1	1	1	4	D	4	D	4	D
22	H144	1	1	1	5	B	5	B	5	B
22	H145	1	1	1	5	B	5	B	5	B
22	H146	1	1	1	5	B	5	B	5	B

The following stack profile (Fig. L.15) summarises the musical development mapping in week 22 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 5 in the interactive domain. The modes for the reactive domain located at level 3 and 5, the proactive domain at level 3 and 5 and the interactive domain at level 5, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
22	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	3	43	P3	3	43	I3	2	33
	R4	1	14	P4	1	14	I4	1	17
	R5	3	43	P5	3	43	I5	3	50
	R6	0	0	P6	0	0	I6	0	0
	Total	7	100	Total	7	100	Total	6	100

Fig. L.15 Stack profile for H in week 22

Musical behaviours and development of H in term three (the school autumn term): weeks 24 to 38

Week 24

After the summer break, the students came back to the school and week 24 was the first lesson in the school autumn term for the new academic year 2007/2008. The whole class was asked to say the poem 'once a man fell in the well, splish, splash, splush he sounded, if he had not fallen in, he would not have drowned' – and repeat it back after a student's switch on each line of the poem. The group repeated the poem after the switch, and H seemed to join in the reading. However, it was difficult to hear H in the group performance (R3C, P3C, I3C).

In a role-play for the poem, a student was appointed to play a cymbal for the splash sounds. H was being the main character. The teacher and H pretended to have a walk and as they passed the student with the cymbal, they were going to imagine that they were falling into a well – which was accompanied with some splashing sounds. In the initial practice, H waved 'bye' to his TA and he used an automatic wheelchair to move independently. H controlled his own automatic wheelchair and moved alongside with the teacher to pass by the cymbal (R4D, I4D). Because they did not hear a splashing sound, the teacher asked the student to try again. H turned himself around and followed the teacher to have a walk again. He seemed to control his automatic wheelchair very well, and he understood the context. This time, H moved in front of the teacher and made a U turn after they had passed the cymbal (R4D, I4D). The student also played the cymbal to create an imaginary water splash. When the teacher asked H, "are you wet?" H answered "yes".

The teacher appointed different students to sing each phrase of the poem in order. When it was H's turn, the teacher read word to word with H. Here was an example:
T: if. H: if.
T: he had not. H: not.
T: fallen in. fallen. H: fallen.
T: in. H: in.
T: well done. (R4A, P4A, I4A).

The teacher wanted the students to practise the song with their TAs and to see if they could sing the song four times without making any mistakes. The song went like this: 'Once a man fell in the well, splish, splash, splush he sounded, if he had not fallen in, he would not have drowned'

(1 2 3 4 5 5 5 | 1 2 3 4 5 5 | 1 2 3 4 5 5 5 | 5 4 3 2 1 1 1).In individual practice, H was working with his TA and he seemed to partially imitate the last word of some phrases. H sang the words on 'drowned', 'well' and 'splish, splash' (R4A, P4A, I4A). His singing was very quiet and hard to hear. However, he seemed to get the idea of taking turns with another person.

In distinguishing between two or three beats for the song, the teacher stamped his feet to go with the song, and asked the students whether it was in a count of two or three. The TA asked H whether it was two or three and H seemed to say 'two' but his hands were gestured as 'four' (R5B). The TA then helped H to do the sign of two by holding up the last two fingers. H smiled happily.

The teacher sang the song and tapped the beat for the students and then asked them to either stamp or clap to the song with him. H clapped the beat while the teacher sang the song and then the teacher tapped the beat with the students. H's clapping was not entirely in time with the song for his clapping was a bit delayed (R4B, P4B, I4C).

In dividing the class into two groups, the teacher named these as group one and group two. Group one was counting "one" and group two was counting "two" by taking turns. The teacher started in very slow tempo to help the students to get the idea. H was in group one and he seemed to count properly in his own group when taking turns with the other group (R4B, P4B, I4D).

In pair work, the teacher asked H to be 'one' and another student to be 'two'. They were asked to count their numbers in turn. H followed the teacher's hand gesture and did it well when taking turns with another student. In the beginning, H seemed to get muddled because he counted "one" and when the teacher pointed to him again he counted "two". After several practices and with a TA's help, H could count "one" more consistently with another student (R4B, P4B, I4D). H smiled while the other people clapped him. Table L.16 summarises the coding in week 24 for H:

Table L.16 The raw data table for H in week 24

		Domain Categorisation			Element Matching					
					R		P		I	
24	H147	1	1	1	3	C	3	C	3	C
24	H148	1		1	4	D			4	D
24	H149	1		1	4	D			4	D
24	H150	1	1	1	4	A	4	A	4	A
24	H151	1	1	1	4	A	4	A	4	A
24	H152	1			5	B				
24	H153	1	1	1	4	B	4	B	4	C
24	H154	1	1	1	4	B	4	B	4	D
24	H155	1	1	1	4	B	4	B	4	D

The following stack profile (Fig. L.16) summarises the musical development mapping in week 24 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain and level 3 to 4 in the proactive and interactive domains. The modes for the reactive, proactive and interactive domains were located at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
24	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	1	11	P3	1	17	I3	1	13
	R4	7	78	P4	5	83	I4	7	88
	R5	1	11	P5	0	0	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	9	100	Total	6	100	Total	8	100

Fig. L.16 Stack profile for H in week 24

Week 25

In this week, the teacher introduced a new song and the song went like this: 'Mister Ram Goat-O, Bam-ban-dy ya! Mister Ram Goat-O, Bam-ban-dy ya! Can you lend me a razor? Bam-ban-dy ya! It's to shave off my long beard, Bam-ban-dy ya!'

(55 5 6 | 5 1 1 1 | 1 55 5 6 | 5 1 1 1 | 1 12 3 11 | 6 5 1 1 1 | 1 12 3 11 | 6 5 1 1 1 | 1 ‖). The teacher sang the song and then asked the students where this song had come from. When the teacher asked, 'had it come from China?' H said, 'oh, yeah, China' by repeating after the teacher (R4D, P3D, I3C). Then H raised his hand and wanted to answer the question. When the teacher asked him the question again, he said,

'Ala, Ala' and the teacher replied 'Ala is not a country'. H laughed.

Later on, the teacher asked the students to guess what animal was in the song. The teacher gave the students some hints by saying it was not a cat and it was not a cow and H repeated after the teacher and said 'cow'. While listening to the teacher's singing, H seemed to sing 'bam-ban' with the teacher on the last phrase and pointed to himself (R5B, P3D, I3C). After the singing, the teacher asked H to sing 'bam-ban-dy ya' and H sang 'bam-ban' very quickly when the teacher asked him to sing the phrase (R4A, P4A, I3C).

In taking turns with the teacher to sing this song, H was chosen to sing 'bam-ban-dy ya' and H said 'what' and then sang 'bam-ban' while copying the teacher's singing on this phrase, in pitch and almost in time. In their turn taking singing, here was the example:

T: Mister Ram-Goat-O (55 5 6 | 5), H: bam-ban.

T: Mister Ram-Goat-O (55 5 6 | 5), H: bam-ban.

T: will you lend me your razor (12 3 11 | 6 5)? H: bam-ban.

T: it's to shave my long beard (12 3 11 | 6 5). H: bam-ban.

T: wow. That was fantastic, really really good singing (R5A, P5A, I4D).

In mistake detection, the teacher intended to make mistakes when singing the song and asked the students to say 'stop' when they heard mistakes. As the teacher sang: 'Mister Ram-Goat-O, bam-ban-dy ya. Mister Ram-Goat-O, bam-ban-dy ya, will you lend me your bicycle' (55 5 6 | 5 1 1 1 | 1 55 5 6 | 5 1 1 1 | 1 12 3 11 | 6 5), H initially and immediately said 'no' at the time the teacher sang the wrong word. When the teacher asked H what he had sung, H smiled and the teacher gestured the movement for bicycle, and H said 'yeah'. H did not answer at first and then he was prompted by the TA and teacher and said 'bicycle'. During this activity, H seemed to have found the pattern when to say 'no' or when he was more certain with the wrong words. It seemed that H detected the wrong word in time when the teacher sang the song (R5A, P5A).

In the same activity, the teacher sang 'Mister Ram-Chicken-O, bam-ban-dy ya' (55 5 6 | 5 1 1 1 | 1) and being prompted by the TA, H shouted out 'stop' in a loud voice. The teacher asked him 'What have I done now? What have I said? Chicken?' H

answered the question by saying 'you' and then imitated the word 'chicken'. He seemed to detect the mistakes immediately when the teacher sang the wrong word (R5A, P5A, I3C).

In pair work, H used makaton to sign H for another student's initial and indicated that he liked to work with him when the teacher asked him to choose his partner. He nodded to the teacher when the teacher suggested that he sang 'bam-ban-dy ya'. In order to make sure H understood his task, the teacher asked him 'what do you need to sing?' and H sang 'bam-ban' (R4A, P4A, I4A). Later in singing the song, while taking turns with his peer, H sang several 'bam-ban', well without any prompting, and he did it in the right order all by himself (R5A, P5A, I5A). The teacher then commented to H 'what fantastic singing. Really really good'.

H was chosen by another student to pair work with him. He took turns with the student who used the switch to sing the song. In this activity, H sang 'bam-ban' well in taking turns with the student without being prompted (R5A, P5A, I5A). H seemed to be popular in that day's lesson as many students wanted to work with him. When the teacher joked about his, H said 'no' and sometimes H could be a bit naughty by saying 'no' when the teacher commented that they did good work as well.

In taking turns with the teacher, the students were asked to do the clapping on the rhythm 'bam-ban-dy ya' (♪♪♪ | ♪) and the teacher did the singing part. H clapped the first two notes and then a quaver but not the entire rhythmic pattern following the teacher's instruction (R4B, P4A, I4A). On their initial practice, H clapped three quavers for the rhythm while imitating the TA's clapping on the rhythm (♪♪♪ | ♪) throughout the whole song (R4B, P4B, I4B).

When the teacher asked H to clap the rhythm ♪♪♪ | ♪ while demonstrating the rhythmic pattern, H tapped the rhythm on ♪♪♪ | ♪ with correct pattern in slower tempo. This was the first time he did the rhythmic pattern correctly (R5A, P5A, I5A). However, when taking turns with the teacher's singing, H only clapped two beats and not the whole rhythmic pattern. On the very last phrase, the teacher modelled the rhythmic pattern for H and he clapped one beat only.

In taking turns with the teacher on the same song, the teacher used his thinking voice which meant he sang the song in his head but used a finger to tap the rhythmic patterns quietly on his head and the students needed to clap the rhythm for 'bam-ban-dy ya' (♪♪♪ | ♪). H did not seem to wait until the teacher had finished his thinking voice and he clapped too early. H was a little fast in clapping his part for each phrase (R5A, P4D, I5A). Later the teacher commented 'What a star. Really really good work'.

When extending the activity further, the teacher sang each student's name in exchange for 'Mister Ram-Goat-O' and asked the students to think what they would like to lend to the teacher. The teacher sang the song of a student's name, and asked to borrow his watch, H said 'no, no'. During the song, H clapped parts of the rhythmic pattern on 'bam-ban-dy ya' with the rest of the group when it was their turn in taking turns with the teacher's singing (R5A, P5A, I5A). When singing another student's name for the song, H clapped once for the correct rhythmic pattern with the rest of the group when taking turns with the teacher. At other times, he clapped parts of the rhythmic pattern for the whole song (R5A, P5A, I5A). On the third round of singing the song, the teacher wanted to borrow a jumper from a student for the song and H said 'no'. H's clapping seemed to be getting better and better. Even though he was not exactly in time with the rest of the group, being a little delayed, he clapped two correct rhythmic patterns this time and participated in the clapping three times in total for the whole song (R5A, P5A, I5A).

The teacher took three instruments from the trolley and gave some bells to H. H was asked to shake the bell and to accompany the teacher's recorder playing. Another student also played a hand chime to accompany the performance. The teacher played the recorder for the melody of the song 'Mister Ram-Goat-O'. H seemed to shake the bell well (R3A, P3A).

To help in distinguishing the names of instruments, the teacher took the bell, chime bar and a recorder. The teacher then hid behind the students and played these instruments individually and in order. The first instrument the teacher played was a recorder. The second instrument was the chime bar and the third one was a bell. With the help of a TA, H and his peers discussed which instrument came first, second and the third. It seemed that they got some answers right but it was not clear if they really knew the answers by themselves (R3C). Table L.17 summarises the coding in week 25 for H:

Table L.17 The raw data table for H in week 25

		Domain Categorisation			Element Matching					
					R		P		I	
25	H156	1	1	1	4	D	3	D	3	C
25	H157	1	1	1	5	B	3	D	3	C
25	H158	1	1	1	4	A	4	A	3	C
25	H159	1	1	1	5	A	5	A	4	D
25	H160	1	1		5	A	5	A		
25	H161	1	1	1	5	A	5	A	3	C
25	H162	1	1	1	4	A	4	A	4	A
25	H163	1	1	1	5	A	5	A	5	A
25	H164	1	1	1	5	A	5	A	5	A
25	H165	1	1	1	4	B	4	A	4	A
25	H166	1	1	1	4	B	4	B	4	B
25	H167	1	1	1	5	A	5	A	5	A
25	H168	1	1	1	5	A	4	D	5	A
25	H169	1	1	1	5	A	5	A	5	A
25	H170	1	1	1	5	A	5	A	5	A
25	H171	1	1	1	5	A	5	A	5	A
25	H172	1	1		3	A	3	A		
25	H173	1			3	C				

The following stack profile (Fig. L.17) summarises the musical development mapping in week 25 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at 5 and the interactive domain at level 5, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
25	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	2	11	P3	3	18	I3	4	27
	R4	5	28	P4	5	29	I4	4	27
	R5	11	61	P5	9	53	I5	7	47
	R6	0	0	P6	0	0	I6	0	0
	Total	18	100	Total	17	100	Total	15	100

Fig. L.17 Stack profile for H in week 25

Week 26

Following last week's lesson, the teacher joked about H bringing goats in the school on that day. The teacher asked him how many goats he had brought with him and offered choices of one or three and H pointed one. When the teacher asked H to make a goat's sound, H said 'maaa' (R3D, P3D, I3C) and every student in the class laughed.

H volunteered to help in the class by raising his hands in the air when the teacher asked for a helper. In taking turns, H pressed the switch to sing 'bam-ban-dy ya' in liaison with the teacher who sang the song 'Mr. Ram-Goat-O'. H pressed the switch in correct timing (R5A, P5A, I4D).

H and another student took turns in singing the song 'Mr. Ram-Goat-O'. The teacher instructed H to sing 'bam-ban-dy ya' and H sang 'bam ban'. H and the student took turns to sing the song and H sang 'bam ban' several times when it was his turn for the whole song (R5A, P5A, I4D).

The teacher recorded the melody (1 1 1 | 1) on a switch for 'bam-ban-dy ya'. H volunteered and raised his left hand. The teacher played the whole song on the piano while taking turns with H on the musical phrase (1 1 1 | 1). He pressed the switch on melody (1 1 1 | 1) in time with the teacher's piano playing (R5B, P5A, I5A).

When chanting the musical phrase (1 1 1 | 1 1), the teacher said 'synco-pa ta ta' with clapping and asked H to copy the rhythm. H said 'ta ta' after the teacher and he clapped two quavers after imitating the teacher's clapping twice (R4D, P4D, I4A).

The students went around the circle to take individual turns with the teacher playing on the drum. The students were also needed to take turns in the right order and H was number five. On the second round, H found it difficult to say the words and the teacher demonstrated 'synco-pa ta ta' for him and H imitated by saying 'ta ta' after the teacher (R4D, P4D, I4D).

In another interactive activity, the teacher asked everyone to close their eyes and he sang 'Around goes M, around goes he. He is holding the pen and the key. Around goes M, around goes he, he is holding the pen and the key. Who's got the pen?

(5 5 3 3 | 5 5 3 – | 5 5 3 3 3 | 3 2 2 1 – | 5 5 3 3 | 5 5 3 – | 5 5 3 3 3 | 3 2 2 1 – | 5 5 5 3 – |) and a student, who was given a pen by the teacher while the teacher sang the song, needed to sing 'I got the pen' (5 5 5 3 – |). While the teacher sang the song and gave the pen to H, H smiled and held the pen in his hand. When the teacher sang 'who's got the pen?' (5 5 5 3 – |), H did not move and closed his eyes still. A TA whispered in his ear but H did not seem to understand the activity and he imitated part of the words that TA sang 'I got the pen' (5 5 5 3 – |) (R4A, P3A, I3A). Then the teacher asked H if he had got the pen and H shook his head. The teacher said 'I think you've got the pen' and H said 'no' and he pointed to another student. H smiled but did not want to give out the pen (R4A, P3D, I4B). Table L.18 summarises the coding in week 26 for H:

Table L.18 The raw data table for H in week 26

		Domain Categorisation			Element Matching					
					R		P		I	
26	H174	1	1	1	3	D	3	D	3	C
26	H175	1	1	1	5	A	5	A	4	D
26	H176	1	1	1	5	A	5	A	4	D
26	H177	1	1	1	5	B	5	A	5	A
26	H178	1	1	1	4	D	4	D	4	A
26	H179	1	1	1	4	D	4	D	4	A
26	H180	1	1	1	4	D	4	D	4	D
26	H181	1	1	1	4	A	3	A	3	A
26	H182	1	1	1	4	A	3	D	4	B

The following stack profile (Fig. L.18) summarises the musical development mapping in week 26 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 5 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 3, 4 and 5 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
26	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	1	11	P3	3	33	I3	2	22
	R4	5	56	P4	3	33	I4	6	67
	R5	3	33	P5	3	33	I5	1	11
	R6	0	0	P6	0	0	I6	0	0
	Total	9	100	Total	9	100	Total	9	100

Fig. L.18 Stack profile for H in week 26

Week 27

In singing the 'hello song', H signed 'my name is H' by using makaton imitating the TA's signing when it was his turn to respond in the hello song (R5A, P4D, I4D).

In this week, the teacher introduced a new song. The teacher asked permission from H to use his name in the song and H smiled. The teacher sang 'H, you see nobody pass here? No, my friend. H, you see nobody pass here? No, my friend. Well, one of my biscuits gone, don't tell me so, one of my biscuits gone'. (5 5 5 5555 6 5 · | 3 · 2 1 – | 5 5 55555 6 5 · | 3 · 2 1 5 | 3 3 3 2 2 1 5 5 6 5 | 3 3 3 2 2 1 – ‖). With the help of a TA, H mouthed and hand signed some of the words for his responses on 'no, my friend' and 'don't tell me so'. The teacher demonstrated for him and said 'no, my friend' and H said 'no…friend' with his makaton signing. In another phrase, the teacher said 'don't tell me so' and H imitated 'don't' with signing (R5A, P4B, I5A).

In pair work, H indicated that he wanted to be the helper. A student and H worked together for the song and they sat face to face. H signed the words by imitating the teacher's signing on 'no my friend'. He voiced a word 'don't' for his response on 'don't tell me so' while using makaton to sign 'no' partially prompted by the teacher in taking turns with the student (R5A, P5A, I5A). When they finished, everybody clapped them, and H also tapped his leg as clapping.

In distinguishing the instrumental sounds, the students were asked to close their eyes and the teacher played a tambourine and asked the students what they had heard. On the second time, the teacher played a drum and a shaker together and asked the students

what they had heard. When the teacher played the drum and shaker, H said, 'drum' while facing away from the teacher (R4A). The task got harder and the teacher played three instruments together (drum, tambourine and shaker) and stopped one by one. The students needed to tell which one stopped first, second and last. The correct order was drum, shaker and tambourine. K and H worked together with the help from a TA. H said 'yes' when the teacher said 'did the drum stop first?' There was not much interaction between H and K. The TA tried to explain to H the situation and H looked at K and seemed to say 'well, what do you think?' For the second instrument that stopped, H pointed to the teacher's hand for tambourine, but he was not sure of his answer. H looked at his carer and looked for answers, and he imitated the carer's gesture by pointing to the instrument. H was very dependent on his carer for the answers and imitated his carer's gesture to be presented as an answer (R3A). Then the teacher said 'I think it was the shaker next' and H said 'Yeah'. Table L.19 summarises the coding in week 27 for H:

Table L.19 The raw data table for H in week 27

		Domain Categorisation			Element Matching					
					R		P		I	
27	H183	1	1	1	5	A	4	D	4	D
27	H184	1			4	A				
27	H185	1	1	1	5	A	4	B	5	A
27	H186	1	1	1	5	A	5	A	5	A
27	H187	1			4	A				
27	H188	1			3	A				

The following stack profile (Fig. L.19) summarises the musical development mapping in week 27 for H. His musical behaviours ranged from level 3 to 5 in the reactive domain, level 4 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 4 and the interactive domain at level 5, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
27	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	1	17	P3	0	0	I3	0	0
	R4	2	33	P4	2	67	I4	1	33
	R5	3	50	P5	1	33	I5	2	67
	R6	0	0	P6	0	0	I6	0	0
	Total	6	100	Total	3	100	Total	3	100

Fig. L.19 Stack profile for H in week 27

Week 28

Week 28 was near the school half term. When singing the 'hello song' with H, H had a good grasp of shaking hands with the teacher. Then he stopped this and made a gesture which seemed to say that he did not understand it was his turn. The teacher modelled the signing and singing 'my name is H' and by using the makaton signing he was able to copy well (R4D, P3D, I4D).

In pair turn taking work, H was working with another student on the song 'H, you see nobody pass here? No, my friend. H, you see nobody pass here? No, my friend. Well, one of my biscuits gone, don't tell me so, one of my biscuits gone'. (5 5 5 5555 6 5 · | 3 · 2 1 – | 5 5 55555 6 5 · | 3 · 2 1 5 | 3 3 3 2 2 1 5 5 6 5 | 3 3 3 2 2 1 – ‖). H signed his phrase by imitating the teacher on phrases of 'no, my friend' and 'don't tell me so' while taking turns with his peer. H seemed to sign the makaton well on the word 'friend' and showed some good imitation skills of copy signing (R4B, P4A, I4B). He clapped after, the group's performance.

In order to introduce the concept of rondo, the teacher asked a student to press his switch which produced a rondo theme A (5 5 5 5555 6 5 ·) on piano melody. The other students took turns to sing or play their phrases. The next student answered the question by pressing his switch with recorded piano melody (3 · 2 1 –). Then rondo theme A again and another student answered by playing a big drum. Rondo theme A again and K answered by pressing the switch on piano melody (3 3 3 4 4 2 2 3).

Rondo theme A appeared again and H answered by playing a drum. Back to the rondo theme A and another student answered by playing the guitar. Therefore, the activity structure was like ABACADAFA. When the teacher asked for a helper, H raised his hand and wanted to help. When the teacher called out H's name and asked H to try out a drum, H said 'yeah'. H played well on the monkey drum (R4B, P4A, I4D). In their second rehearsal, H was aware when his turn was and played his drum independently without any prompting (R4B, P4A, I4D). On the third rehearsal, the teacher did not give any instruction. H pointed to a student when it was that student's turn. H was aware of the turn taking and the order well. He played his part on time and in the right order (R5A, P5A, I4D). Another student played the rondo theme A and H played the monkey drum by taking turns with the student, in the right order and with the teacher's verbal prompting (R5A, P5A, I4D).

The teacher divided the students into pairs to take turns with a student who was the rondo theme leader. H and K were in the same team. H played the drum with K when it was their turn, following the teacher's verbal prompting (R5A, P5A, I5A). Table L.20 summarises the coding in week 28 for H:

Table L.20 The raw data table for H in week 28

		Domain Categorisation			Element Matching					
					R		P		I	
28	H189	1	1	1	4	D	3	D	4	D
28	H190	1	1	1	4	B	4	A	4	B
28	H191	1	1	1	4	B	4	A	4	D
28	H192	1	1	1	4	B	4	A	4	D
28	H193	1	1	1	5	A	5	A	4	D
28	H194	1	1	1	5	A	5	A	4	D
28	H195	1	1	1	5	A	5	A	5	A

The following stack profile (Fig. L.20) summarises the musical development mapping in week 28 for H. His musical behaviours ranged from level 4 to 5 in the reactive domain, level 3 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 4, the proactive domain at level 4 and 5 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
28	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	1	14	I3	0	0
	R4	4	57	P4	3	43	I4	6	86
	R5	3	43	P5	3	43	I5	1	14
	R6	0	0	P6	0	0	I6	0	0
	Total	7	100	Total	7	100	Total	7	100

Fig. L.20 Stack profile for H in week 28

Week 30

After half term, the students came back to the school in week 30. When singing the 'hello song' with H, H copied the makaton from the teacher and demonstrated his name 'my name is H' correctly and in the right place while the teacher waited and modelled the response for him (R5A, P4A, I4A).

By way of introduction to the class, the teacher played a piece of Indian music. As long as the music was played, H smiled and raised his hands into the air. And he said 'I know that one'. H then vocalised along with the CD music, quietly but audibly. This was the first time the researcher saw him used his voice in the music lesson. He also danced to the music, with full engagement. While moving to the music, H vocalised along with the CD music and used certain gestures to convey meaning, e.g. pointed. These gestures looked like some kind of dance for a few seconds. It was very impressive to see H dancing on his own initiative (R5A, P5B, I5A). The teacher commented afterwards 'very nice singing, H'.

When the teacher asked the students where this music had come from, H answered 'mmm…Allah. Allah' (P3D). Table L.21 summarises the coding in week 30 for H:

Table L.21 The raw data table for H in week 30

		Domain Categorisation			Element Matching					
					R		P		I	
30	H196	1	1	1	5	A	4	A	4	A
30	H197	1	1	1	5	A	5	B	5	A
30	H198		1				3	D		

The following stack profile (Fig. L.21) summarises the musical development mapping in week 30 for H. His musical behaviours ranged from level 5 in the reactive domain,

level 3 to 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 3, 4 and 5 and the interactive domain at level 4 and 5, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
30	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	1	33	I3	0	0
	R4	0	0	P4	1	33	I4	1	50
	R5	2	100	P5	1	33	I5	1	50
	R6	0	0	P6	0	0	I6	0	0
	Total	2	100	Total	3	100	Total	2	100

Fig. L.21 Stack profile for H in week 30

Week 32

In reviewing different rhythmic patterns, the teacher asked H to tap the rhythm 'ta ta ti ti ta' (♩ ♩ ♪♪ ♩), H imitated the teacher's tapping and tapped out the rhythm on his knee. He seemed to tap the correct rhythmic pattern well (R4B, P4A, I3C).

In introducing the Indian music, the teacher said that in the Indian concert the audience needed to join in the playing and to help in keeping the rhythm going rather than sitting down and listening to it. The students were asked to count the beat and clap the rhythmic patterns, as if they were the participating audience in a concert: 1(clap) 2 3 4, 5(clap) 6 7 8, 9 (wave) 10 11 12, 13(clap) 14 15 16. The rhythmic names to be learned were 'ta ding ding da, ta ding ding da, ta ting ting na, da ding ding da' (♩ ♩ ♩ ♩ | ♩ ♩ ♩ ♩ | ♩ | ♩ ♩ ♩ ♩ | ♩ ♩ ♩ ♩ |) which coincided with their counting on 16 beats. The teacher asked H to do the clapping but although he was a bit slow H did clap and wave the way he had been asked (R5A, P4B, I4A).

To make the rhythm more complex, the teacher substituted the 'da' and 'ding' to 'dage' and the new rhythmic patterns were: 'da ding dage ding, dage dage ding da, ta dage ding na, dage dage ding da' (♩ ♩ ♪♪ ♩ | ♪♪♪♪ ♩ ♩ | ♩ ♪♪ ♩ ♩ | ♪♪♪♪ ♩ ♩ |). When the teacher asked K to clap the rhythmic patterns, H clapped with the teacher in the group but here again his clapping and waving movements were a bit delayed throughout

the two practices (R5A, P4D, I4A).

In order to make the rhythm even fresher, the teacher added a faster rhythm called 'tareketa'. The new rhythmic phrase became 'da ding ding da, tareketa dage ding da, tareketa dage dage da, tareketa dage ding da' (♩ ♩ ♩ ♩ | ♪♪♪♪ ♪♪ ♩ ♩ | ♪♪♪♪ ♪♪ ♪♪ ♩ | ♪♪♪♪ ♪♪ ♩ ♩ |). The teacher asked H to do the clapping and waving and H clapped his hands, with lots of extra rhythm, and he did not even look at the teacher's modelling. He clapped his own rhythm and beat. However, on the second practice, he did follow the teacher's clapping and waving, but with a delayed response (R5A, P4D, I4A).

In listening to the computer sound track, the teacher loaded many tabla sounds on the computer. When listened to a tabla sound track, the teacher modelled for the clapping and waving. H imitated the teacher's action but with a bit delayed response (R4B, P4D, I4A). With the tabla sound tracks, H's clapping was occasionally in time with the teacher's clapping. It was difficult to tell if it was by coincidence only while having the drumming rhythm going as a background beat (R4B, P4D, I4A).

In these different tabla sound tracks, the teacher wanted the students to choose what they liked best out of number one, two or three. H clearly indicated that he liked number 2. He held out two fingers and said two. He also touched another TA and pointed two to her (R4B).

The teacher set up a zither sound on the keyboard and asked the students to try out the sounds. H was asked to play the white notes on the keyboard for the zither sound, by pressing it down nice and hard. H pressed the keys one by one following the teacher's instruction. Then the teacher asked him to play more and he seemed to take a long time to decide which key to play (R5A, P5B). The teacher instructed H to use two hands to play. H then used alternative hands, and the way he played was very structured by taking turns with different hands. His right hand played the same note and left hand went up the scale for each note (R5B, P5B). The teacher later commented that 'H, you are so methodical the way you played. Thank you very much. H, have you been secretly practising? That is brilliant'.

At the end of the lesson, the teacher reviewed and played back what the students had composed as a group for their Indian music. The teacher put the zither sound track number two, because it was the majority vote, and a drumming pattern that the students

had chosen. Then he also put the zither sound track number one in as H had voted for it. H pointed and clapped his hands when number one music came up (R5A). Table L.22 summarises the coding in week 32 for H:

Table L.22 The raw data table for H in week 32

		Domain Categorisation			Element Matching					
					R		P		I	
32	H199	1	1	1	4	B	4	A	3	C
32	H200	1	1	1	5	A	4	B	4	A
32	H201	1	1	1	5	A	4	D	4	A
32	H202	1	1	1	5	A	4	D	4	A
32	H203	1	1	1	4	B	4	D	4	A
32	H204	1	1	1	4	B	4	D	4	A
32	H205	1			4	B				
32	H206	1	1		5	A	5	B		
32	H207	1	1		5	B	5	B		
32	H208	1			5	A				

The following stack profile (Fig. L.22) summarises the musical development mapping in week 32 for H. His musical behaviours ranged from level 4 to 5 in the reactive domain, level 4 to 5 in the proactive and level 3 to 4 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
32	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	0	0	I3	1	17
	R4	4	40	P4	6	75	I4	5	83
	R5	6	60	P5	2	25	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	10	100	Total	8	100	Total	6	100

Fig. L.22 Stack profile for H in week 32

Week 33

When trying out notes of zither sounds on the keyboard, H was instructed to play with the white keys. In improvisation, H played the white notes with the scale up step by step with slow tempo. When the teacher modelled for H, H did it perfectly. The teacher then wanted H to do it from the low ones right up to the high ones and then from the top to

bottom. H tried the left hand the first time and it didn't work. Then he tried his right hand and created the exact glissando sounds like the teacher, all by himself (R5A, P5B). The teacher later commented 'Fantastic. Really really good. H, really nice work'.

After a TA and a student had listened to the different Indian music drumming to decide which one to use, H came back from outside and the TA explained to him what they were doing. After listening to the music, H said 'no…I like it. Allah, Allah… I like it' (R5A). Table L.23 summarises the coding in week 33 for H:

Table L.23 The raw data table for H in week 33

		Domain Categorisation			Element Matching					
					R		P		I	
33	H209	1	1		5	A	5	B		
33	H210	1			5	A				

The following stack profile (Fig. L.23) summarises the musical development mapping in week 33 for H. His musical behaviours ranged from level 5 in the reactive domain, level 5 in the proactive. The modes for the reactive domain located at level 5, the proactive domain at level 5, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
33	R1	0	0	P1	0	0	I1	0	N/A
	R2	0	0	P2	0	0	I2	0	N/A
	R3	0	0	P3	0	0	I3	0	N/A
	R4	0	0	P4	0	0	I4	0	N/A
	R5	2	100	P5	1	100	I5	0	N/A
	R6	0	0	P6	0	0	I6	0	N/A
	Total	2	100	Total	1	100	Total	0	N/A

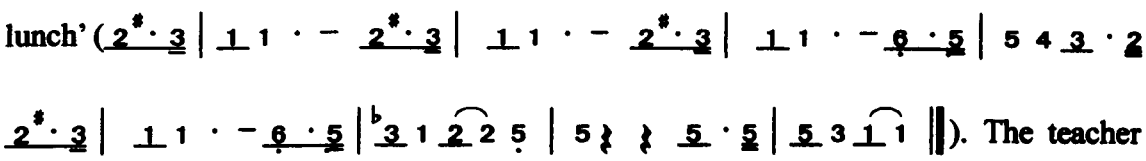
Fig. L.23 Stack profile for H in week 33

Week 34

From this week, the teacher started to prepare the students for their end-term musical performances. The teacher started to tell the story 'Jack and the Beanstalk. When the teacher asked H 'how much do you think you can sell a cow for?' H showed the teacher three fingers (P4D, I4B). When the teacher asked H 'what else they were selling at the market', H answered 'chicken'. H answered the question by himself, and this showed that he had understood the context and the question (P4D, I4B).

H seemed to engage in the teacher's story telling. When the teacher told the students 'when Jack went home and showed the beans to his mom...She was mad with him and she got so cross that she shouted at him. She took it from Jack and she chucked them in the trash bin', H said 'no' along with other students (P4D, I4B).

Then the teacher asked H what the leaves were made of that grew at the top of the beanstalk. At first, H gestured that he did not know. The teacher offered some possible answers e.g. chocolate, and then H shook his head and did not think they were made of chocolate. When the teacher suggested they were made of chicken, H nodded and said 'mm' to indicate that they were made of chicken (P4D, I4B). But the teacher then explained that they were made of something more expensive than chicken. Later, the teacher told them that the leaves were made of gold.

The song that the class was preparing to do at the end term musical performance was called 'crunch'. The lyrics and melody were: 'Oh the giant has a honker and is shiny like a great big conker. If the giant gets a whiff of you, then crunch you are the giant's lunch' (). The teacher introduced some actions to go with the song. H imitated the teacher's actions and pointed to his nose with both hands, twice, for the word 'conker' (R4D, P4A, I4A). In a later practice, after repeating each phrase by a student pressing the switch, H imitated the teacher's actions on more words, such as giant, honker, shiny, conker, giant and crunch (R4D, P4A, I4A). When it was K's turn to be a leader to press the switch to sing the song, H imitated the teacher's actions on words, such as honker, shiny, conker, giant and crunch (R4D, P4A, I4A). In other practices, the teacher started singing each musical phrase and H imitated the actions well, but with some delayed timing (R5A, P4D, I4D).

When it was H's turn to be a leader to sing the song, the teacher recorded each musical phrase of the song on the switch. After H pressed each musical phrase, everyone in the classroom imitated the singing and did the actions. H's switching was getting quicker. He listened well and waited to take turns with the rest of the group's singing (R5A, P5A, I4D). The teacher commented 'H, brilliant switching. Beautiful singing. Very good'.

When it was another student's turn to be the leader to sing the song, H imitated the actions of the song on the words: 'honker, shiny, conker and crunch' well (R5A, P5A, I5A). Then the teacher played the song once more and H clapped improving in time with the music (R5A, P5A, I5A).

In pair turn taking, H raised his hand to volunteer to be the helper. H was very good in taking turns with the other students, in using the switch he showed that he had good timing in reading the poem in the song (R5A, P5A, I4D). The poem went like this: 'Wham, your strawberry jam; Smash, your beans and mash; Squeeze, your mashy pease; Squish, your batter fish; Whoop, your chicken soup; Yam, your chewing gum; Squeal, you curry eel'. The student's phrases were 'wham', 'smash', 'squeeze', 'squish', 'whoop' and 'yam'. H's phrase was the second sentence after the initial word e.g. 'your strawberry jam'. When the teacher gestured the chicken soup, H's facial expression was very interesting. Table L.24 summarises the coding in week 34 for H:

Table L.24 The raw data table for H in week 34

		Domain Categorisation			Element Matching					
					R		P		I	
34	H211		1	1			4	D	4	B
34	H212		1	1			4	D	4	B
34	H213		1	1			4	D	4	B
34	H214		1	1			4	D	4	B
34	H215	1	1	1	4	D	4	A	4	A
34	H216	1	1	1	4	D	4	A	4	A
34	H217	1	1	1	4	D	4	A	4	A
34	H218	1	1	1	5	A	4	D	4	D
34	H219	1	1	1	5	A	5	A	4	D
34	H220	1	1	1	5	A	5	A	5	A
34	H221	1	1	1	5	A	5	A	5	A
34	H222	1	1	1	5	A	5	A	4	D

The following stack profile (Fig. L.24) summarises the musical development mapping in week 34 for H. His musical behaviours ranged from level 4 to 5 in the reactive domain, level 4 and 5 in the proactive and level 4 to 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
34	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	0	0	I3	0	0
	R4	3	38	P4	8	67	I4	10	83
	R5	5	63	P5	4	33	I5	2	17
	R6	0	0	P6	0	0	I6	0	0
	Total	8	100	Total	12	100	Total	12	100

Fig. L.24 Stack profile for H in week 34

Week 35

When the teacher sang the 'hello song' to H, H shook hands with the teacher (R5A, P4A, I4A). Then the teacher made a joke and called H by another student's name because he had sat next to the student last week. H seemed to say 'no'. When the teacher sang the 'hello song' with K and asked H had K gone to sleep, H said 'no'. H had a good awareness of other students and could readily know whether people were awake or not. H also said 'hello' when the teacher greeted him (R5A, P5A, I4A).

The teacher played the CD to sing the song 'crunch' and clapped with the song, H tapped one beat on his leg after following the teacher's clapping in the song for a few times (R5A, P5A, I4A). H then interacted with another student with a fist to fist gesture. Then H and the student took turns in reading the poem in the song. H imitated the words from the teacher during the activity. Here was an example:

T: H, can you say 'wham'? H: wham.

T and a student (A): your strawberry jam.

T: Smash. H: (sma)sh.

T and A: your beans and mash.

T: Good work, Fantastic. Squish. H: sh.

T and A: your better fish

T: whoop. H: woo. Yeah?

T and A: your chicken soup.

T: you say yam. H: yam (R4D, P4A, I4A).

T and A: your chewing gum

T: together you say 'squeal you curry eel'. You know something you were amazing.

When the teacher praised the two students, he also did the fist to fist interaction with H and the other student. On the second and third practice, H shouted 'yam' and he also said 'eel' clearly twice (R4D, P4A, I4A). When listening to the CD singing again, H did

not follow or imitate the staff's actions but he did tap his feet when he was supposed to clap in the song a few times (P3C, I3C).

When using music to depict that Jack climbed the beanstalk, H indicated that he wanted to play the keyboard. In using different instrumental sounds to make the music, H said 'change' to indicate that he wanted to use different sounds and the teacher changed the sound to a harp and asked him if he liked the harp sound, H said 'yeah'. The teacher also asked H if he would like a drum to go with the music, H said 'ok'. The teacher found some drum loops to go with H's music. When the drum sounds appeared, H smiled and raised his thumb. The teacher pointed to the key and H pressed it one by one. After a while, when H got the idea, he then played it by himself. When he had finished, he raised up his left hand to welcome everyone's clapping (R5A, P5B). The teacher commented, 'wow, that was fantastic, brilliant climbing. Well done!' Table L.25 summarises the coding in week 35 for H:

Table L.25 The raw data table for H in week 35

		Domain Categorisation			Element Matching					
					R		P		I	
35	H223	1	1	1	5	A	4	A	4	A
35	H224	1	1	1	5	A	5	A	4	A
35	H225	1	1	1	5	A	5	A	4	A
35	H226	1	1	1	4	D	4	A	4	A
35	H227	1	1	1	4	D	4	A	4	A
35	H228		1	1			3	C	3	C
35	H229	1	1	1	4	D	4	D	4	D
35	H230	1	1		5	A	5	B		

The following stack profile (Fig. L.25) summarises the musical development mapping in week 35 for H. His musical behaviours ranged from level 4 to 5 in the reactive domain, level 3 to 5 in the proactive and level 3 to 4 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 4 and the interactive domain at level 4, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
35	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	1	13	I3	1	14
	R4	3	43	P4	4	50	I4	6	86
	R5	4	57	P5	3	38	I5	0	0
	R6	0	0	P6	0	0	I6	0	0
	Total	7	100	Total	8	100	Total	7	100

Fig. L.25 Stack profile for H in week 35

Week 37

In the dress rehearsal, the school staff and the students did actions with the music CD singing. H was supposed to imitate the staff's action on the song but he was very busy putting the microphone on his lap so he missed the actions. One of the staff saw this and then she took H's microphone away. H then focused on the actions of the song, while imitating the staff's actions quite well and in time, and in signing most of the parts of the song (R5A, P5A, I5A). When it was K's and another student's turn on the switch, H imitated the staff's action in time to the music singing, and he could do most of the actions by himself (R5A, P5A, I5A).

H and another student took turns on the poem reading. H held up the poster from a member of the staff and imitated her by saying the words 'wham', 'smash', 'squeeze', 'squish', 'whoop', 'yam' and the other student and a staff member responded 'your strawberry jam', 'your beans and mash', 'your mashy pease', your batter fish', 'your chicken soup', 'your chewing gum' (R5B, P5A, I5B). Everyone clapped their performance. Table L.26 summarises the coding in week 37 for H:

Table L.26 The raw data table for H in week 37

		Domain Categorisation			Element Matching					
					R		P		I	
37	H231	1	1	1	5	A	5	A	5	A
37	H232	1	1	1	5	A	5	A	5	A
37	H233	1	1	1	5	B	5	A	5	B

The following stack profile (Fig. L.26) summarises the musical development mapping in week 37 for H. His musical behaviours ranged from level 5 in the reactive domain, level 5 in the proactive and level 5 in the interactive domain. The modes for the reactive domain located at level 5, the proactive domain at level 5 and the interactive domain at

level 5, respectively.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
37	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	0	0	I3	0	0
	R4	0	0	P4	0	0	I4	0	0
	R5	3	100	P5	3	100	I5	3	100
	R6	0	0	P6	0	0	I6	0	0
	Total	3	100	Total	3	100	Total	3	100

Fig. L.26 Stack profile for H in week 37

Week 38

Week 38 was near the school Christmas break in 2007 and was near the end of the researcher's fieldwork observations. On the performance day, H imitated one member of the staff's actions, in good timing, and managed most of the actions (R5B, P5A, I5A). When it was K's turn on the switch for the first verse of the chorus, H's action was a bit behind the staff but he seemed to be concentrating well (R5B, P5A, I5A). When it was another student's turn on the switch for the second verse of the chorus, H imitated and followed the staff's actions, with only seconds delayed, but he did it well (R5B, P5A, I5A).

H and another student took turns on the poem reading. H imitated the staff's saying of the words and held up the posters which the staff gave to him. H said the following words: wham, smash, squeeze, squish, wee (for whoop), yam and squeal (R5B, P5A, I5B) in taking turns with another student. When the audience clapped him, he put his thumbs up to them in response. He was so pleased. Here was an example of the turn taking activity:

H and staff: Wham,

S: your strawberry jam;

H and staff: Smash,

S: your beans and mash;

H and staff: Squeeze,

S: your mashy pease;

H and staff: Squish,

S: your batter fish;

H and staff: Whoop,

S: your chicken soup;

H and staff: Yam,

S: your chewing gum;

H and S and all the other staff: Squeal, you curry eel.

Table L.27 summarises the coding in week 38 for H:

Table L.27 The raw data table for H in week 38

		Domain Categorisation			Element Matching					
					R		P		I	
38	H234	1	1	1	5	B	5	A	5	A
38	H235	1	1	1	5	B	5	A	5	A
38	H236	1	1	1	5	B	5	A	5	A
38	H237	1	1	1	5	B	5	A	5	B

The following stack profile (Fig. L.27) summarises the musical development mapping in week 38 for H. His musical behaviours range located at level 5 in the reactive, proactive and interactive domains. The modes for the reactive, proactive and interactive domains were all located at level 5.

WK	R			P			I		
	Level	Freq	%	Level	Freq	%	Level	Freq	%
38	R1	0	0	P1	0	0	I1	0	0
	R2	0	0	P2	0	0	I2	0	0
	R3	0	0	P3	0	0	I3	0	0
	R4	0	0	P4	0	0	I4	0	0
	R5	4	100	P5	4	100	I5	4	100
	R6	0	0	P6	0	0	I6	0	0
	Total	4	100	Total	4	100	Total	4	100

Fig. L.27 Stack profile for H in week 38

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